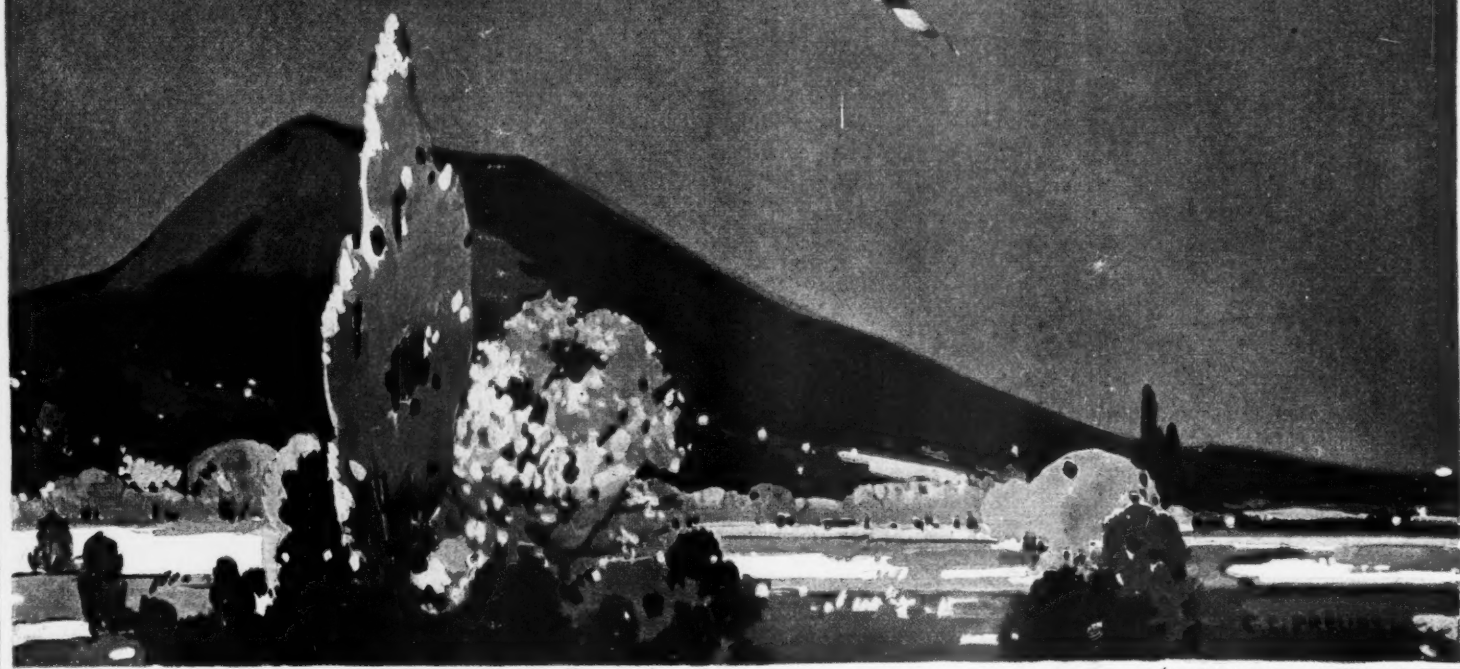


# AMERICAN FRUIT GROWER MAGAZINE



April, 1930  
*Ten Cents a Copy*



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A SIX IN THE PRICE RANGE OF THE FOUR

# American Fruit Grower

## MAGAZINE

The National Fruit Journal of America

VOLUME 50

NUMBER 4

### Does the Apple Need Advertising?

THE "APPLES FOR HEALTH" movement, after many spurts of seeming progress, appears again to be languishing for want of sustenance. No feasible plan has been developed for the raising of funds wherewith to "advertise" the apple.

The movement arose out of a conference called in 1926 by leaders in horticulture and industries dependent on the fruit crop, to devise plans that might stimulate apple consumption to the point of absorbing the tremendous over-production of that season. A plan was adopted that called for the raising of a sum of money sufficient to "put the apple back on the American table" by national advertising. In the discussion at that time the point was stressed that persistent advertising of citrus fruits had "pushed the apple back into second place," a view that apparently had many adherents.

Much has been made of the success attending the national advertising of such fruits as oranges, raisins, cranberries, without giving thought to the comparatively restricted territories in which these fruits are produced.

An interesting contribution to the more vital phases of the discussion is supplied by Wells A. Sherman, chief marketing specialist in charge of the Fruit and Vegetable Division of the Bureau of Agricultural Economics, in his book "Merchandising Fruits and Vegetables" (McGraw-Hill), from which the following quotations are made:

"During 1925 and 1926 the national trade organizations in the fruit and vegetable industries had under consideration a project for launching a nation-wide advertising campaign to stimulate the greater use of fresh fruits and vegetables.

"The statistics and arguments presented in favor of the enterprise were drawn largely from the field of manufactured and trade-marked goods. The chief difficulties in the minds of many of the leaders in the industry centered around the problem of an equitable distribution of the financial burden. It seemed to be felt that if all who grow and distribute these products would share the expense of the campaign the enterprise would be justified and the industry stimulated to the great advantage of all.

"This is perhaps a natural state of mind for men who have helped, consciously or unconsciously, to push new fruit or vegetable areas to the point of overexpansion. They feel that the markets ought to take all that these areas can produce. They have seen several 'Eat More' campaigns during and following the World War. They fail to realize the reason for the great increase in the consumption of some of the goods they handle. They do not realize that nothing they can say through the press can be

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half so appealing as the constant display of the products themselves, and that this most persuasive appeal is being made continuously as an incident to the ordinary processes of trade.

"Attractive as is the proposal it is basically unsound for this particular industry whose products are unlike those of manufacture. The people will eat every day. Their food habits can be changed, but not to any great extent by the advertising of dealers in any one group of foodstuffs, especially

a group which is sold so very generally on display and bought by individual selection.

"The industry has now reached a point where it must choose between a reduced rate of expansion or a permanently lower price level. Neither program is a pleasing prospect. Other influential business groups are affected. Nurserymen and seedsmen must suffer if plantings are curtailed. Manufacturers of spraying equipment and of chemicals for dusts and sprays want increasing rather than diminishing acreages planted. Package manufacturers have a similar interest in an ever-increasing volume of production. So have the carriers. The interests of fertilizer manufacturers are identical with those of the nurseryman and seedsman.

"All these groups are accustomed to advertising their own products or services. It is not strange that they are ready to foster campaigns to stimulate even greater consumption of the raw products upon which the welfare of their own enterprises depends. Some of these groups have led already in 'campaigns' the economic wisdom of which is open to question.

"Money should not be wasted in advertising with the forlorn hope of creating a demand which will absorb a flow of perishables increasing during the next five years as it has in the past."

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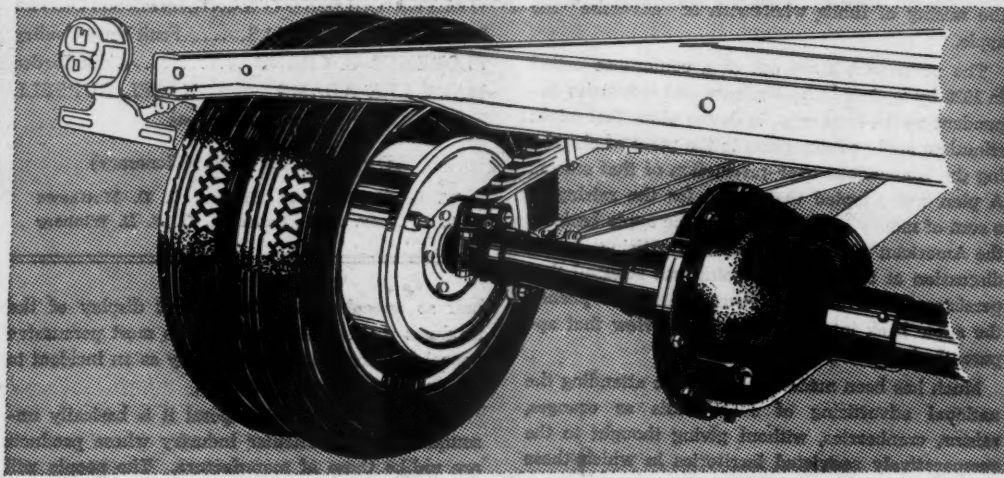
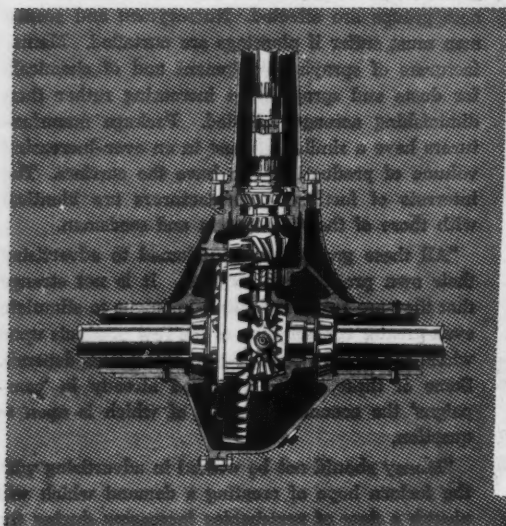
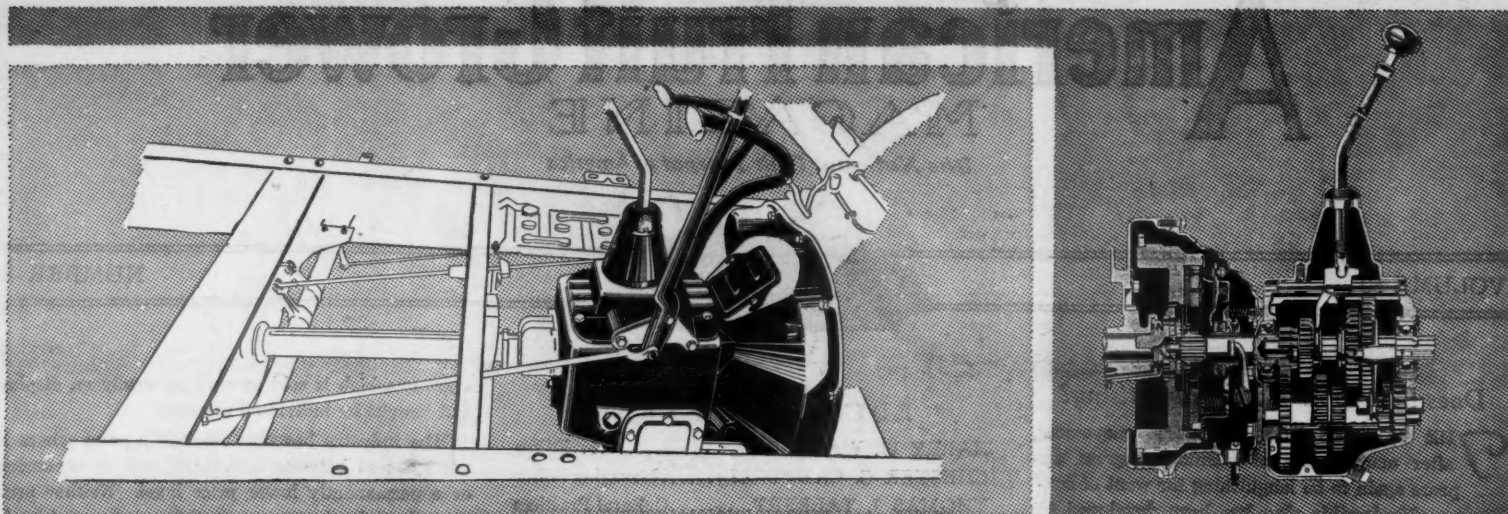
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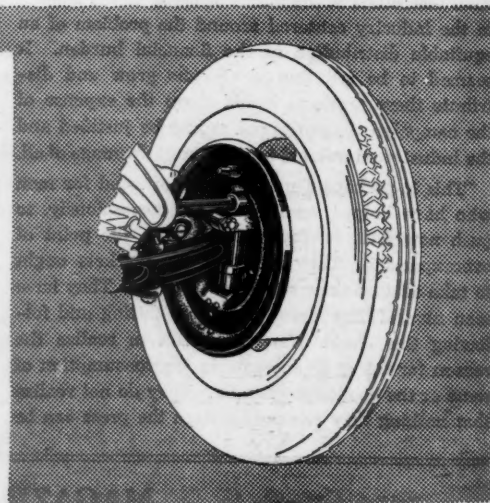
# New features of the FORD TRUCK

THE Ford  $1\frac{1}{2}$ -ton truck is a haulage unit carefully designed to provide unusual performance under a wide variety of conditions, and long, reliable service at minimum cost. With 4-speed transmission and 40-horse-power engine, the Ford truck has a remarkably flexible range of speed and power.

Rugged strength is a feature of the Ford truck. An important example is the new rear axle. It has a special spiral bevel gear, with straddle-mounted pinion. The axle shafts are heavier than formerly, and because of the three-quarter floating type of construction, they serve only to turn the wheels, without carrying any of the weight of truck or load.

The new front axle and spring are heavier and stronger, as are front radius-rod, king-pins, wheel bearings and thrust bearings. Brakes on the front wheels have been enlarged to the same size as those on the rear wheels, providing increased braking area and a high degree of safety. Brakes are of the mechanical type, internal expanding, and all are fully enclosed.

Dual rear wheels are available at small additional cost. Balloon tires of one size are used throughout, with the dual equipment, so that all six steel disc wheels and tires are interchangeable all around. Only one spare wheel and tire need be carried.

**LARGER BRAKES . . . Providing a greater degree of safety**

# Is the PEAR TREE RESPONSIBLE for BLIGHT on APPLES?

By H. R. ROSEN  
UNIVERSITY OF ARKANSAS

**G**REAT AS THE advance of American civilization has been, it cannot be entirely considered in the nature of progress. Among the losses or regressions that have been experienced, the gradual extinction of the pear tree constitutes one of the most recent and most vivid examples. In none of the older civilizations has this occurred. Endowed with soil and climate remarkably well adapted to the growing of the very finest varieties of this fruit, as many regions of the United States are, we nevertheless have been witnessing the almost complete extermination of our best pears. In only a few more or less restricted regions of the country can the Bartlett, Clapps Favorite, Anjou or other choice pears now be found alive. And, judging by the cries that have arisen from pear growers along the Pacific Coast within the past few years, we may even do without the canned Bartlett pear in the near future.

What is the reason for this widespread cataclysm? Why have the plant doctors been unable up to the present to prevent it?

## Pear Blight Difficult to Control

**A**T present there are four types of recommendations for controlling fire blight: first, excision of all diseased parts, a very laborious and time-consuming operation; second, the planting of resistant varieties, a recommendation which up to the present has meant the abandonment of almost all of our finest quality pears; third, spraying the trees with a germicide, particularly during the blooming period, this being a recommendation which was brought forth in the nineties, more or less abandoned for about 30 years and again offered during the last few years; and fourth, surface disinfection of cankers. Hundreds of proprietary cures have been on the market, many of them in the form of capsules, powders, and liquid decoctions which were to be variously applied to the trees and without exception they have all failed to effect a control.

## Apples Being Substituted for Pears

**S**O complete has been the failure to control pear blight, particularly in the Middle West and South, that pear growing has been abandoned and apples frequently substituted. With the planting of many apple orchards, resulting in a greater concentration of this crop, the blight soon became a serious menace to such varieties as Spitzenburg, Jonathan, Yellow Transparent, Maiden Blush, and Grimes Golden.

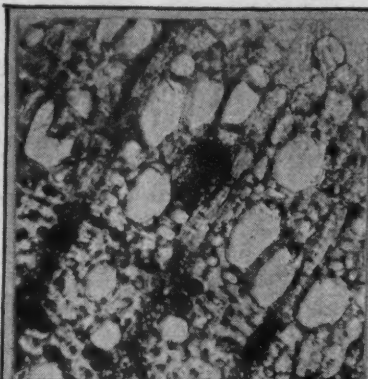
Seeking in desperation for some measure that would bring relief, the apple growers in several States grasped at the idea that the few pear trees remaining in the vicinity of their apple orchards were responsible for the blight on apples. They were convinced that the germ lives over winter largely in pear trees and was disseminated from them in the following spring to nearby apples.

In this belief they were partly sustained by the fact that scientists for about 30 years had supposed the germ to overwinter almost entirely in blight cankers situated on large limbs or on the trunk. Inasmuch as such cankers are relatively rare on apples and are very common on pears, then it is quite obvious, if the scientists' supposition were correct, that the pear tree offers exceptionally favorable conditions for overwintering the germ and disseminating it to other hosts.

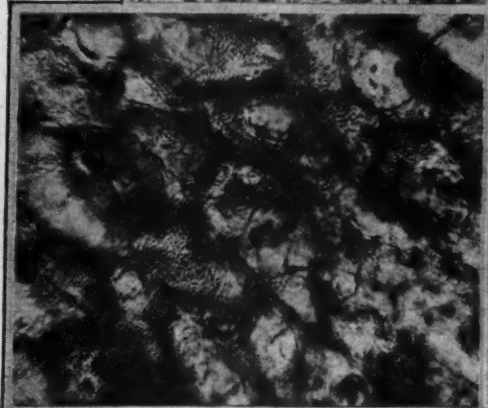
## Does the Apple or Pear Harbor Blight Germ?

**I**S it true that the pear harbors the fire blight germ through the winter, and not the apple, and is it also true, as various scientists have supposed, that the microbe overwinters mainly in large limb cankers or on the main trunk? For several years the writer has been engaged in studying this disease with the hope of obtaining answers to these questions. The results of some of these investigations have recently appeared in various technical journals and bulletins. Here the attempt

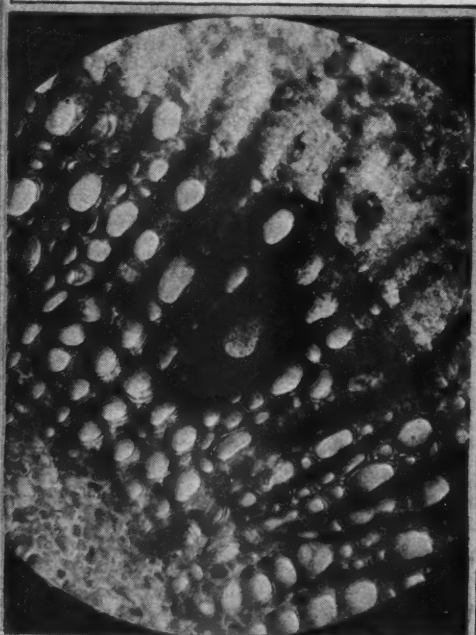
**The General Belief That the Germ of Fire Blight Carries Over the Winter Entirely in Blight Cankers on Pear Trees Is Not Well Founded. Experiments Over a Series of Years Show the Blight Germ Frequently Overwinters in the Apple.**



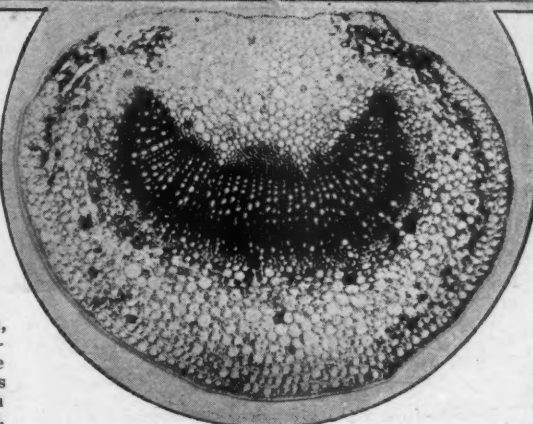
(At left). A magnification of the wood of a pear stem showing a granular mass of bacteria occupying a water duct near the center. Magnified about 350 times.  
(Below). A microscopic view of the granular mass of bacteria present in one duct in the woody part of a pear leaf stalk, in the center of the dark areas.



(Lower right). A view under a high powered microscope showing the bacteria within an infected pear petal. The germs are so minute that placed end to end it would require 25,000 to make a line one inch in length. Magnified 550 times.



(In circle). A relatively low magnification of an infested leaf stalk of a pear showing the disease in the darker region near the flat surface at the top of the picture. The bacteria cannot be seen. This view is magnified about 50 times.



will be made to present the more important findings in non-technical language.

As compared with certain susceptible apple varieties, pears are generally found to be more severely blighted, with more dead blossom clusters, diseased twigs, or dead limbs, in a given season. It is also true that blossom blight usually occurs first on pears. This, however, is due to the fact that certain pears bloom one to two weeks earlier than apples so that if blossom blight develops, it must necessarily occur first on pears. It is obvious, therefore, that unless this is taken into consideration, one would be inclined to draw the erroneous conclusion that pears are responsible for carrying the germ over winter because the disease is frequently noted first on pears.

## Any Blighted Host Will Spread the Disease

**A**N odd factor here enters into the problem of overwintering on pears and apples which has confused a great many growers. It frequently happens that when susceptible apples are located near badly blighted pear trees, the disease is very apt to be far more serious than on similar apple varieties which are not in the vicinity of blighted pears. There can be no doubt that this is true and it is this association which has occupied the minds of orchardists.

When this association is coupled with the fact that a

heavily infected pear tree frequently possesses more blighted tissues than a severely infected apple, it becomes all the more obvious why an apple grower would associate the blight on apples with that on pears. But the following is also correct, namely, that in the presence of severely infected apple trees the same disease is very likely to be more abundant on nearby apples or pears. In other words, given any badly blighted host, the disease will spread from it to susceptible plants which happen to be near.

It, therefore, is clear that while pear trees do offer a special menace to the apple trees because of the greater amount of blight and the larger numbers of blight producing germs which the pear engenders, the blight on apples will by no means be eradicated by the simple expedient of removing pear trees.

## Germ Found to Overwinter in Both Apples and Pears

**E**XPERIMENTS conducted by the writer over a series of years have clearly shown that the blight producer frequently lives over winter in the apple as well as in the pear. The germ has been isolated from apple twigs and limbs throughout the winter and spring and such isolations have in every instance produced typical blighting when they were inoculated into healthy pear trees. One of the interesting discoveries which these investigations has revealed, consisted in finding the microbe in the small twigs and limbs which had been blighted the previous season. Although several investigators had previously made the same observation, their work has largely been overlooked or disregarded. We are now, therefore, in a better position to understand why the germ lives over winter in the apple and also why it is unnecessary to seek for blight cankers on large limbs or on trunks in order to explain successful overwintering.

Another discovery that has been made involves the symptoms of the blighted twig and limb in relation to the presence of live germs. Among scientists it has been a common belief for many years that it is only in those cankers which possess an indefinite or uncracked margin that the microbe manages to stay alive. If a rift or crack is formed along the margin of a blighted area, then it has been assumed that the infected tissues dry out sooner or later and by so doing kills the parasites.

As about 95 per cent or more of all blighted twigs and limbs show such cracks in the fall of the year and thereafter, if the above theory were correct, then, as far as blight control is concerned, all that would be necessary would be to remove the five per cent or less of the infected twigs and limb cankers which show uncracked margins. Unfortunately, this is not the case. The writer has found the germ to be alive in as many cankers with cracked margins as in those that are without cracks. The explanation for this is as follows.

## Why Removal of Cankers Fails to Control Disease

**A**S germs gain entrance into the bark they multiply rapidly by their ability to break up cell walls and cell contents, and utilizing these for food purposes. Then as they increase in number they migrate to nearby tissues. This migration has in the past been looked upon as being mostly an upward or downward movement. The horizontal or inward passage of the bacteria has largely been overlooked for the reason that it is very difficult to cut wood thin enough so as to make clear microscopic observations without losing the bacteria. By using other methods, this difficulty has been overcome and the bacteria have now been observed far in the interior, within the wood, and photographed. As the marginal cracks involve only the outer bark tissues the reason why cankers with cracked margins are capable of harboring live bacteria becomes obvious.

The finding of the parasite deep in (To Page 25)

# FRUIT CROP PROSPECTS for 1930

**T**HIS REPORT is not an estimate of prospective production. It is merely a compilation of comments from sources which are believed reliable and are offered only for the purpose of giving a "bird's-eye view" of the situation in the various States, as observed. It should be borne in mind that observations this early in the season may be altered materially by subsequent conditions, either favorable or adverse.

## PEACHES

For the country as a whole it would appear that the peach crop has been more or less damaged by the low temperatures during the past winter. The comments indicate crop injury generally through the northeastern and north central States, ranging from complete loss to fair condition. Comments from the southern States are more optimistic. In the Northwest, trees in some areas have been damaged to some extent with only fair prospects on the whole. Whether the reported damage is going to mean more than a good thinning of the fruit is difficult to determine at this early date. At any rate, it should be borne in mind that in the northern States there has been no bloom as yet and weather from now on may alter the present outlook materially.

## APPLES

It is too early to determine with any degree of certainty the effect of weather conditions the past winter on the apple trees. The general opinion expressed would not indicate any general injury to the trees.

## PEARS

Comments on pears run about the same as on apples. No severe damage is evident as yet.

## CHERRIES

In some sections cherries are reported to have suffered as much as peaches from the low temperatures of the past winter. In most sections, no definite information is yet available, but generally there does not now seem to be any widespread damage.

## CARLOT SHIPMENTS

The generally short fruit crops of 1929 are being reflected in the lesser carlot movement. Total *Apple* shipments up to March 15 were about 22 per cent less than the movement for the corresponding period a year ago. The western shipments are reduced about one-fourth from last year, while the eastern States have shipped about one-fifth less. *Pear* shipments to March 15, 1930, are about 15 per cent less than the shipments for the corresponding period of a year ago. All *Citrus* fruits have been shipped in less quantity than last year. *Grapefruit* shipments to March 15 this year are about five per cent less than a year ago. Imports from Porto Rico have been nearly four times as great (amounting to 1262 cars) up to March 15 this year than they were up to March 16, 1929. Imports from Cuba have been 330 cars this year as compared to 220 last year. Movement of *Oranges* up to March 15 has been about 30 per cent under the shipments of last year up to March 16. Imports from Porto Rico amount to 511 cars thus far this year as compared to 60 cars last season. Carlot shipments of *Lemons* thus far (March 15) are only about half as many as were moved up to March 16 last year.

The brief summary of shipments of fruits, in the center table, is taken from the report of the Division of Fruits and Vegetables.

## NEW ENGLAND

New England *apple* trees have come through the winter with only slight damage. However, in *southern Maine* and *New Hampshire* a heavy ice storm last fall caused some injury to some orchards. Partridges, also, have caused slight damage and in some instances wild deer have been bothersome. Most orchardists protect their trees from the mice so that, except for a few cases, no injury from this source has been sustained.

Fruit buds on *apple* trees have not begun to swell yet, but most reports indicate that the bloom will be about normal except where there was a heavy crop produced last year. The recent warm weather is not expected to have any adverse effects. In most sections McIntosh show very good prospects, while Baldwins and Wealthy are only fair.

*Peach* trees did not fare so well as apples as most reports indicate quite severe injury from the extensive low temperatures. In many orchards fruit buds appear to be dead and it is likely that the peach crop will be cut very short in New England this year. Many young trees have died during the past season from lack of moisture in the late summer months and winter ice storms.

**In response to many calls for pre-season comments on condition of trees and fruit prospects in general throughout the country, the following reports from some of the State statisticians of the Crop Reporting Board have been assembled by the Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, for the information of those interested. It is planned to issue similar reports during the early season whenever conditions warrant.**

*Raspberries* and *blackberries* also have suffered considerable injury from low temperatures.

## NEW JERSEY

A warm rainy spell, followed by low temperature about the middle of February, did considerable damage to New Jersey peach buds.

In the Riverton and Beverly sections of Burlington county, the damage to *peaches* was slight. Elbertas, which in this area show a rather light set, suffered some, but other varieties show nearly a normal fruit bud set. The situation in the vicinity of *Moorestown* shows that damage is quite irregular. Orchards on favorable sites with plenty of air drainage seem to have escaped, while those located in lower places suffered considerable damage. All varieties seem to have suffered about the same damage, which will average from 25 to 50 per cent in this area.

The *Hammononton* area was hit the hardest. The crop in this territory will be very light, with damage running in individual orchards as high as 90 per cent. Elbertas were severely injured. Hales and Greensboros also suffered considerably. In the adjoining Vineland section most of the orchards on high ground escaped with light

Carlot Shipments of Fruits to March 15, 1930, with Comparisons

	March 9-15 1930	March 2-8 1930	March 10-16 1929	Total this season to Mar. 15	Total last season to Mar. 16	Total last season
<b>APPLES</b>						
Total .....	1,120	1,010	1,346	93,071	120,274	127,530
Western States .....	622	428	792	45,557	60,735	64,822
Eastern States .....	598	582	554	47,514	59,539	62,708
PEARS .....	55	46	51	20,560	24,185	24,439
<b>GRAPEFRUIT</b>						
Total .....	702	538	966	15,230	16,020	24,554
Imports Cuba .....	6	6	0	330	220	220
Imports Porto Rico ..	66	75	0	1,262	356	447
LEMONS .....	139	119	307	2,250	4,532	17,329
ORANGES .....	1,730	1,590	2,423	31,758	45,280	101,765
Imports Porto Rico ..	23	28	0	511	60	60
MIXED CITRUS .....	307	272	357	8,180	7,201	11,077

injury, while those in hollows were considerably damaged.

The damage in the *Bridgeton* section is estimated from 40 to 50 per cent. In *Gloucester* county damage was less severe than in other areas, but individual orchards are reporting damage as high as 50 per cent.

It would seem that a conservative estimate of the total damage in the State, as near as can be estimated at present, will run from 25 to 50 per cent.

## PENNSYLVANIA

Reports from the *southeastern* commercial peach districts state that 35 per cent of the *peach buds* in the lowlands have been killed. In some orchards, the failure is complete, but, despite the damage reported, the State as a whole may have a good crop this year. Some peach nursery stock has been winter injured, but the supply is still considered ample to meet the demand.

So far, a good *apple* crop is in prospect, and no damage to *grapes* in the Erie Belt has been reported.

## ILLINOIS

*General*: All fruit authorities in Illinois rate 1930 *peach* crop outlook as a failure, due to prolonged and severe winter temperatures. Apple and pear prospects somewhat uncertain yet, but crop prospects are considered fair at present.

Early reports on *apples* indicate around an average crop outlook to date. The prolonged severe winter appears to have damaged the Jonathan (leading variety) crop prospect more adversely than other varieties, however, sufficient buds remain on Jonathans to produce a fair or near average crop unless materially reduced by later damage. Prospect for most other varieties is up to average or better to date. Some tree injury is apparent more particularly to young trees, but if early season conditions are favorable they may grow out of it with small permanent injury.

Some uncertainty prevails as yet with regard to *pears*, but most of the fruit authorities believe that the pear prospect is rather similar to apple outlook.

All *peach* reports indicate a complete failure in Illinois with considerable tree injury. It is impossible to estimate tree injury at this time. Some authorities think that with the exception of a considerable loss of one-year-old plantings (small percentage of total tree numbers) that the actual loss of trees will be moderate. Most of the trees may grow out of it if we have a favorable season for growth.

## MICHIGAN

The present outlook is thought to be satisfactory for all fruits except peaches. The temperature on January 18 fell to a minimum of -18 to -24 degrees in various parts of Berrien, Van Buren, and Allegan counties, the leading *peach* section. An examination of *peach buds* in Berrien and Van Buren counties shows very few if any live buds. In Allegan, the situation seems to be a little better and scattering reports from Kent county indicate there will be at least a partial setting of peaches. In Oceana and Mason counties, the situation is believed to be still better as no reports of serious damage have been received from there; the temperatures only fell to -4 to -10 degrees.

The fall weather was favorable for the trees and it is believed they have suffered no damage except possibly in occasional orchards in the southwestern counties. The chief danger to the fruit crop now is that of spring freezes which, should they occur after a period of warmth sufficient to start the buds, may cause extensive injury. This has happened in portions of the Michigan fruit belt in each of the last three years.

## MISSOURI

*Peaches* are generally a complete loss. Low temperatures were recorded in late November and one or two days in December to be followed by the lowest temperatures in January for many years—as low as 30 below zero and 15 below was common throughout the whole peach growing section. Comments on peach damage in March indicated a complete loss, although occasionally men reported a few scattering blossoms. Much damage was done to trees and growers expect to cut back heavily this spring.

*Apples* appear to come through without much damage. Jonathans and a few other varieties of similar type are reported as having some damage to wood and to blossom. Last July and August were so very dry that trees do not have normal or best development. Recently the weather has been warm enough to push apple buds very rapidly and with the present warm weather they can quickly arrive at a stage where a sudden cold spell could do heavy damage.

*Cherries* were hurt some by the freezes this winter.

*Pears* do not seem to have been injured seriously. *Plums* have no reported damage but season is pushing the bloom which puts them in jeopardy from an early freeze.

*Raspberries* and *blackberries* are frozen back badly from the extreme temperatures of January.

## GEORGIA

General information from Georgia on the *peach* situation indicates bud damage from freeze ranging probably 40 per cent in *Northeast* section, 25 in *Midstate* and practically no damage in *Southern* territory, probably 10 to 15 per cent for the State. Frost of March 19 may account for additional damage. Blooming is generally later than usual. Bud crop set only fair, due to lack of fertilizer in many orchards after failure of last year, with consequent effect on vitality of trees. While too early to figure on production, the number of buds apparently safe is sufficient for a fair sized crop under normal conditions from now on.

## FLORIDA

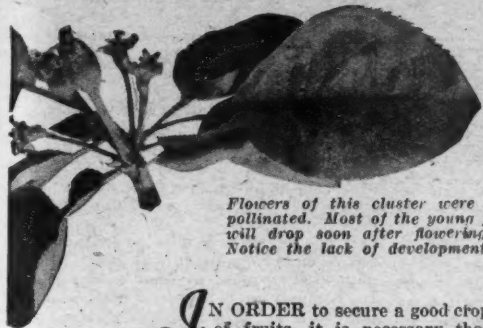
Florida *citrus* trees are now in bloom. According to personal observation and reports, there is a good bloom in all the principal citrus sections of the State. There has been plenty of moisture to date and present prospects seem favorable for the coming crop. There has been no frost damage to citrus.

## TENNESSEE

Temperatures of as low as 16 degrees above around the third of March did some damage to the *peach buds*, but it is thought that there are enough remaining to make a fair crop. On March 18 about 80 per cent of the late, and about 40 per cent of the early peaches, were in full bloom. With favorable weather, and if the oriental moth does not take too heavy a toll, the prospects are for a much better crop than last year.

Probably 25 per cent of the trees are not being fertilized and worked this year, (To Page 20)

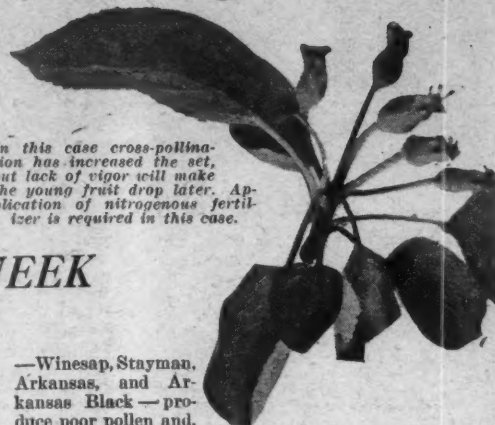
# The POLLINATION of TREE FRUITS



Flowers of this cluster were self-pollinated. Most of the young fruit will drop soon after flowering. Notice the lack of development.

Many Causes May Combine to Prevent a Full Set of Fruit—Faulty Pruning, Spraying or Other Orchard Practices. Lack of Vigor May Need to Be Corrected. If Pollination Trouble Exists, It May Be Remedied by the Introduction of Bees or Proper Pollinizers or Both into the Orchard to Increase the Set.

In this case cross-pollination has increased the set, but lack of vigor will make the young fruit drop later. Application of nitrogenous fertilizer is required in this case.



By A. E. MURNEEK

UNIVERSITY OF MISSOURI

**I**N ORDER to secure a good crop of fruits, it is necessary that the flowers, which eventually develop into fruits, be properly pollinated and fertilized. Pollination is the transfer of the pollen grains, the male elements of the flower, to the moist surface of the stigma, the female organ of the flower. There the pollen germinates, extending a long tube into the central part of the flower, where the act of fertilization takes place. Flowers which are not pollinated and fertilized will drop soon after blossoming or else will develop into fruits which fall off while still small.

## Honey Bees Necessary for Proper Pollination

**P**OLLINATION is accomplished by insects, usually the common honey bee. If during the time of flowering bees are not present in any quantity in the orchard, then the set of fruit will be small. Likewise, when the flight of bees is interfered with by low temperature or rainy weather, then most of the flowers will remain unpollinated and as a consequence will not develop into fruits. Hence, in order to assure as much as possible the proper transfer of pollen from flower to flower, bees must be provided at blossoming time. No effective pollination can be obtained when bees are absent, since other insects usually are of minor consequence in this respect.

If bees are not found in the immediate neighborhood, the commercial fruit grower should secure a number of good colonies for his orchard. Usually one hive per acre will be sufficient, except where the trees are very large and in full bearing, when more may be necessary. This is especially true in years when weather conditions are very unfavorable during blossoming and, therefore, the possible period of pollination is reduced to a minimum. In most localities bees may be rented for the flowering season at two to five dollars per colony. This is indeed a small expenditure for the results that may be expected from this practice.

## Most Commercial Apple Varieties Self-Sterile

**I**N many instances improper pollination is not the only reason for a poor yield of fruit. The weather may be ideal for insect flight, still the set of apples may be very sparse or the trees may be totally barren. How is this to be explained in all such cases where killing frosts have not been a factor and otherwise the orchard has received good care?

Extensive investigations at the Missouri and other agricultural experiment stations have shown that most commercial varieties of apples are self-sterile or else are greatly benefited by cross-pollination. They will not set many fruits when pollinated by their own pollen, but will do so much more readily when the pollen comes from a tree of another variety. Hence, a proper set of apples may be expected only when bees have a chance to visit flowers of several varieties.

Since practically all of our common varieties of apples are either self-sterile or are markedly benefited by cross-pollination, it is highly desirable in establishing a new

orchard that at least two, but still better three, varieties be planted together. For best results every third row should be of the pollinating sort, though planting every fourth or even sixth row for this purpose has frequently given satisfactory results.

Under Missouri conditions the following varieties of apples, in order of their preference, have been found to be the best producers of good viable pollen: Delicious, Jonathan, Ben Davis, Golden Delicious, and Grimes. They will not only pollinate each other effectively, but can be also safely interplanted with practically any variety for this purpose.

On the other hand, the members of the Winesap group

—Winesap, Stayman,

Arkansas, and Ar-

kansas Black—pro-

duce poor pollen and,

therefore, need to be

planted together with other varieties. Because of this

defect, they normally will not cross-pollinate each other

and may be considered more or less inter-sterile.

## Increasing the Set in Solid Blocks of Varieties

**I**N cases where an orchard has been planted to one variety and pollination has become a decidedly limiting factor to proper yields of fruit, the grower can resort to two things. He may top graft every fourth or sixth row with a pollinizer, say Delicious or Jonathan, or, to lessen the work and secure relief to some extent, at least every third tree in every third row should be top worked.

As a temporary expedient and while the grafted trees attain the age of full flowering, branches of a good pollen-producing variety may be set in the orchard at flowering time. They should be cut just before the blossom buds begin to open and placed in pails or barrels containing plenty of water. Bees will visit the flowers on these branches and thus assure to a considerable degree inter-pollination. It must be emphasized that, in order to make this type of pollination extensive and effective, there must be present in the orchard an ample number of these large "bouquets" of flowering branches and they must not be permitted to dry out.

## Peaches and Sour Cherries Ordinarily Benefited by Cross-Pollination

**S**INCE all commercial varieties of peaches, except the J. H. Hale variety, apparently are self-fertile, they can be planted in solid blocks. Unless it will be shown more definitely that cross-pollination increases appreciably the size of the fruit, interplanting of peaches for pollination purposes is not necessary but may be desirable for other reasons, such as adaptation of certain sorts to varying soil conditions, the extension of the harvesting and marketing season, etc.

Sour cherries, though normally producing good crops when self-pollinated, may be benefited, in some years at least, by cross-pollination. Thus Early Richmond and Montmorency, our two leading varieties, will crop better through a series of years when interplanted and sometimes when supplied with other sour cherries as pollinizers. It should be noted, however, that the exact pollination requirements of the sour cherries have not yet been established. The Dukes, May Duke and Royal Duke, are self-sterile. They must be interplanted with sour cherries to insure fertilization of the flowers.

Even when proper pollination takes place, trees, though blooming profusely, sometimes will not produce fruit. Under such conditions the use of a nitrogenous fertilizer will frequently remedy the situation. Either nitrate of soda or ammonia sulphate, applied (To Page 25)

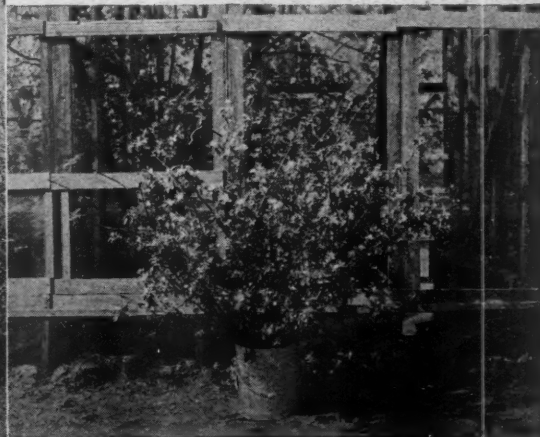
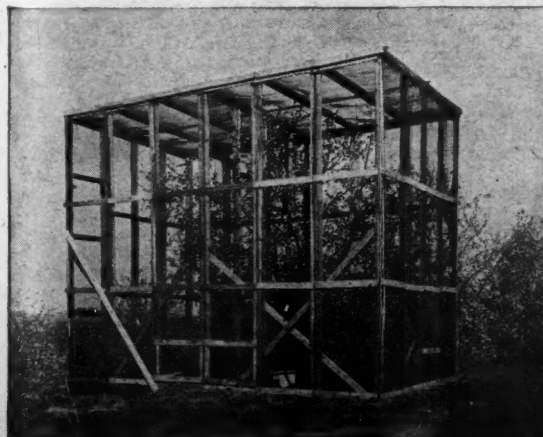


(Above). Size of apples of the second and third drop in a condition of lack of vigor. Only one fruit usually persists.

(Below, left). Double cages, each half enclosing one quarter of a tree, a small colony of bees, and a "bouquet" of branches of a selected pollen variety, are used for cross-pollination studies at the Missouri station.

(Right). "Bouquets" of this kind are used in cages for cross-pollination. When made up of branches of a good pollinizer and distributed through a block of trees of a self-sterile variety, an increased set may be expected. Bees must be present to transfer the pollen.

(Center). Large cheese-cloth bags are used for the study of self-sterility in apples.





## QUESTIONS and COMMENT

Conducted by T. J. TALBERT

Questions on fruit growing problems and on general horticulture will be answered through this department if of general interest. For reply by mail enclose 2c stamped envelope (air mail 5c). Address AMERICAN FRUIT GROWER MAGAZINE, 53 West Jackson Blvd., Chicago.

### FEEDING FRUIT TREES

IT HAS NOT been long since fruit growers generally believed that fruitfulness and vegetative growth were diametrically opposed to each other. At the present time, however, investigators and producers are agreed that fruitfulness actually depends upon a vigorous vegetative growth. Excessive growth on the other hand does have a tendency to reduce fruitfulness, particularly when such growth is prolonged into the late summer or fall.

Growth and fruitfulness can be maintained in the average bearing orchard by one or all of the following cultural practices: Cultivation, early spring applications of either nitrate of soda or sulphate of ammonia in sod orchards, and by judicious pruning. Instead of using commercial fertilizers, barnyard manure may be used, but it is seldom that sufficient quantities can be obtained for anything like extensive use.

#### When Trees Need Fertilization

THE problem of determining whether the trees in the orchard would be benefited by applications of nitrogenous fertilizers must be worked out by the grower himself. Where he finds the terminal growth averages from six to eight or more inches and the spur growth amounts to about one-fourth to one-half inch or more annually, and the trees have large, healthy, dark green foliage, it is doubtful if nitrogenous fertilizers would be helpful.

On the other hand, if the terminal growth of the trees is less than six inches and few if any fruit spurs make more than one-fourth inch growth annually and the leaves of the trees are small and pale green in color, it is probable that the trees would respond profitably to applications of nitrogenous fertilizers.

#### Need of Water

TOO much emphasis cannot be placed upon the fact that fertilizers will not be made adequately available to the roots of the trees in order to produce the growth desired unless a sufficient supply of moisture is at hand. Moisture may be stored in the soil through a proper supply of humus. Where humus for any reason is lacking, the soil becomes hard quickly after rains, and large cracks may be produced in drought periods. As a result, trees on such soil suffer for the lack of water. It behooves the grower, therefore, to grow leguminous cover crops or non-leguminous cover crops and turn them under, thus placing an adequate supply of humus in the soil.

Humus may, of course, be procured by applications of manure or by applications of straw or other organic matter. When such material is turned or plowed under, humus is formed. This decaying organic matter acts like a sponge in holding water and in releasing it to the root hairs for absorption. Moreover, humus gives aeration to the soil, thus promoting the growth and development of soil bacteria, which are needed in transforming chemical compounds and making available plant food to the roots of the trees.

#### Value of Cultivation

ON fairly level soil where washing is not dangerous, cultivation may be practiced with good results. The soil moisture may be conserved by the use of a dust mulch, by preventing growth of weeds and grass, and by keeping up the humus content of the soil by plowing under cover crops. Through cultivation better aeration is obtained, more food is made available to the roots, and additional nitrogen may not be needed if a system of cultivation and cover crop growth is used.

#### Sod Orchards

APPLE orchards located on sod land will be benefited greatly by

applications of nitrogenous fertilizers. It is well known that in many instances a sod must be maintained in the orchard to prevent washing. In other orchards sod fits into the orchard soil management plans better than cultivation. Where a sod is maintained, it is important that all clover and grass and other vegetation which is mowed in the orchard be left where it falls or be raked and placed around the trees some distance from the trunks. Such practices help to keep up the fertility of the soil and maintain tree vigor.

#### How Apple Crops Are Increased

SOME of the most important ways or methods of increasing the apple crop through fertilization are as follows: (1) by increasing the percentage of set, (2) by increasing the size of the apples, (3) by invigorating the fruit spurs, making them more likely to form fruit buds, (4) by increasing the size of the trees and consequently the bearing surface, and (5) by making the trees more resistant to diseases and insects.

#### Nitrogen All Important

OF all the kinds of fertilizers supplying nitrogen, the following three are the most important for fruit: Manure, nitrate of soda, or sulphate of ammonia. All factors considered, no nitrogen-carrying fertilizer, it is believed, is as important as manure. This is true because manure not only acts as a fertilizer supplying the fruit trees with nitrogen in a fairly readily available form, but it improves the aeration and tilt of the soil. The mechanical or working condition of the soil being made better increases its water-holding capacity and as a result reduces the danger of washing and the danger from drought in dry seasons.

**Commercial Fertilizers.**—The chief substitutes for manure are nitrate of soda and sulphate of ammonia. These commercial products contain larger percentages of nitrogen than manure. This gives them an advantage in that they are easier to transport and to handle. Sodium nitrate contains about 15 per cent nitrogen, depending upon the amount of moisture present; while ammonium sulphate contains about 20 per cent nitrogen. Only three-fourths as much sulphate of ammonia as nitrate of soda is needed for the same amount of nitrogen.

While manure is all important in orchard fertilization, yet were it possible to

obtain it in sufficient quantities, it is believed that most good fruit growers would want to use some of the chemical fertilizers in addition to manure. This is true because early spring applications of sodium nitrate or ammonium sulphate are much more effective in increasing the set of fruit on apple trees than manure applied at the same time. This is due to the chemical fertilizers being more readily or quickly available to the roots of the trees.

#### Amount of Fertilizer to Use

THE amount of fertilizer to use per tree will depend upon the age of the trees and the cultural practices adopted in the particular orchard. For sod orchards, the general practice is to use about one-fourth pound for each year of age of the tree, until the tree reaches an age of 30 years. The amount of fertilizer to be used on trees over 30 years of age is generally about eight to 12 pounds. For cultivated orchards, it is the common practice to use only about one-half of the amounts suggested for sod orchards.

Chemical fertilizers are generally applied on the soil around the outer branches of the trees. Since the fertilizer is quickly dissolved by moisture or even by the damp soil, it is not necessary to cultivate and work it into the soil. Trees absorb soil nutrients rapidly and where sulphate of ammonia or nitrate of soda will dissolve quickly when placed on the soil, it soon reaches the tiny root hairs and is taken into the cell sap and used as food.

#### Fertilizer Needed Per Apple Tree in Sod Orchards

(Cultivated orchards may need about one-half amount suggested for sod orchards.)

Age of Tree	Nitrate of Soda	Sulphate of Ammonia
1 yr.	4 oz.	3 oz.
2 yrs.	8 oz.	6 oz.
3 yrs.	12 oz.	9 oz.
4 yrs.	16 oz.	12 oz.
5 yrs.	1½ to 2 lbs.	1 to 1½ lbs.
6 to 8 yrs.	2 to 3 lbs.	1½ to 2 lbs.
9 to 12 yrs.	3 to 4 lbs.	2 to 3 lbs.
13 to 30 yrs.	4 to 8 lbs.	3 to 6 lbs.

#### Time to Fertilize

IT is generally believed that the best time to apply commercial fertilizers is about two weeks before the blooming period or when the buds begin to swell and the green leaves make their first appearance. In the case of apples, however, fertilizers applied after the blooming season have little effect in altering the growth conditions of the fruit-producing spurs.

## QUESTIONS and ANSWERS

To give practical and helpful answers to a great variety of questions dealing with cultural practices of fruits from all parts of the United States, it is necessary in some instances to treat the questions in a more or less general manner. For this reason it is suggested that, where more specific and definite information as applied to local conditions is desired, inquiry be made to the county agent or the State experiment station.

#### Soil for Raspberries

I would like to know if raspberries require damp ground. I want to set out a new patch this spring. One end of my old patch is very damp and the berries from this section were much larger than the others. Was the damp ground the cause?—W. V. H., Missouri.

RASPBERRIES are adapted to a wide range of soil types, but extremes should always be avoided. The plants are very sensitive to an excess of moisture. The soil, therefore, for best results should not be wet for a long period in the spring. Good drainage is just as essential as an adequate moisture supply in midsummer.

The ideal soil is a sandy or light clay loam, well filled with organic matter, which not only furnishes plant food but acts also as a reservoir for moisture.

In all probability that part of your

raspberry patch located in the damper soil was more favorably situated as regards to moisture needed by the plants than other parts of the plantation. If you, therefore, have additional soil similar to that upon which you have received good results, it might be well to extend your planting in the damper and more suitable soil type.

#### Oyster Shell Scale

I am sending a small branch of an apple tree. Can you tell me what is affecting this limb and what to do for it? I have a young orchard and I find several of the trees affected in this way.—O. C., Pennsylvania.

AN EXAMINATION of the small branch of an apple tree which you sent shows it to be badly infested by the insect known as oyster shell scale.

This scale insect may usually be con-

trolled in a satisfactory way by the application of dormant sprays consisting of lime-sulphur solution used at a strength of 1 to 7.

Where for any reason the infestation has become as serious as apparently it has on your trees, it is usually advisable to use instead of lime-sulphur a miscible oil spray, as oil applications generally give better results than lime-sulphur under such conditions.

You may use as growth is starting, or even after the leaves appear, any of the standard oil sprays manufactured by reliable concerns. You may also use lubricating oil emulsion made according to the government formula or by the cold-mix method.

If for any reason it is inconvenient to secure oil, you perhaps will find lime-sulphur used as suggested above satisfactory. It is important, however, that the spraying work be very thoroughly done, and the application should be made at an early date.

#### The Use of Dusts

Our orchard is just a little too big to take care of with our sprayer. A good many times weather conditions bother us and then we cannot catch up with our spraying work. Will dusting give good satisfaction? Can a grower mix his own dusts in a good sized box with a hoe? What is the right mixture between lime and sulphur? Where can I obtain the superfine sulphur and the right kind of lime?—P. H. L., Michigan.

DUSTING has come into more general use than formerly during the past few years. All who have made a study of both dusting and spraying will acknowledge that each has certain advantages which are generally well known to the best fruit growers. Where for any reason the roughness and slope of the land, the labor difficulties, or other factors make it unprofitable to spray an orchard, dusting is to be recommended over an inefficient or poor job of spraying.

It must be remembered, however, that where aphides and scale are to be controlled, sprays are necessary. Moreover, orchardists generally who are relying chiefly upon spraying should with our present information continue to place their chief dependence for the control of pests upon spraying operations instead of dusting.

Dusting may at times, however, serve the grower very well, indeed, by supplementing the spraying work. This is often particularly true when the ground is wet and soft, making the operation of heavy spray tanks over the ground practically impossible. Dust applications may also be made nearer harvest time with less danger of an objectionable spray residue being left on the fruit.

Where growers have sufficient acreage and investment to justify the purchase of two types of outfits, it is believed that both dusting and spraying may prove profitable in the orchard enterprise, providing the equipment is used to advantage. It must also be said that in general where either diseases or insects are very difficult to control, spraying usually gives better results than dusting.

Orchardists who have not had experience in dusting should try the practice out on a small plot or acreage before attempting to adopt the new method over the entire orchard. It is also important that final conclusions be based on at least two or three years' results rather than one.

Both dusting and spraying operations are being made better. The machinery for handling liquids and dusts is being improved from time to time; the chemicals used are also more satisfactorily made. It is believed, therefore, that the fruit grower in the not distant future may look forward to substantial advancement in both methods of protecting his fruit crop against the ravages of diseases and insects.

It is impossible for a grower to do his own mixing of dust materials, as you suggest. Since few have the time or equipment necessary for the making of the dusting materials, growers generally will secure better results by buying their dusting mixtures and employing them according to the directions of the manufacturers.

The so-called sulphur-lead dust generally consists of 90-10 (90 pounds of sulphur and 10 pounds of arsenate of lead) mixture. Sometimes an 85-15 dust is used effectively.

(To Page 23)



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# THREE PROJECTS to SEEK CONTROL for ORIENTAL PEACH WORM

Efforts of National Horticultural Council Secure Appropriation for Projects to Study Oriental Fruit Moth in Three Commercial Peach Areas. Will Seek Eradication of Pest.

By JOHN NAPIER DYER

AT THE WINTER meeting of the Indiana Horticultural Society held in Indianapolis last December, a resolution was passed authorizing the president of the society to take the lead in the calling of a conference of the heads of all State horticultural societies and affiliated interests to discuss matters pertaining to the welfare of the industry and

particularly to endeavor to obtain adequate support for a campaign for control of the oriental peach moth.

The conference was held in Washington, D. C., on January 14 and 15, conforming to the time of the annual meeting of the National Horticultural Council.

Acting on a request from the Indiana society, the council had, after some pre-

liminary correspondence, sent a committee to confer with the Secretary of Agriculture relative to a plan for large scale experiment work to control the peach moth, and the report of the council committee to the horticultural conference disclosed a willingness on the part of the Department of Agriculture to undertake the experimental work if a sufficient sum of money could be obtained from Congress.

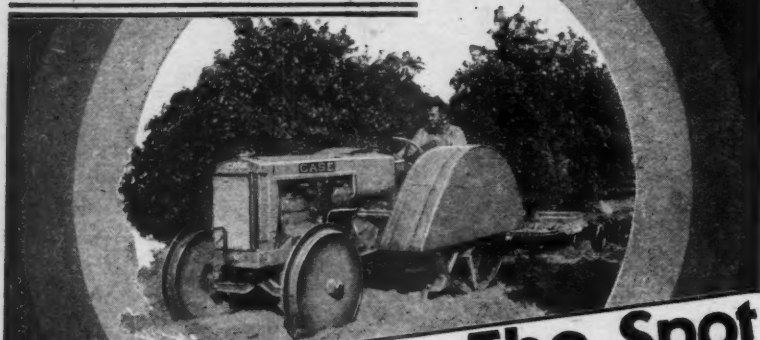
The horticultural conference endorsed the plan as outlined by the committee of the council and passed a strong resolution, which was sent to the Secretary of Agriculture and the Chairman of the Finance

the amount of the appropriation to \$100,000, which provided for two experimental areas instead of three. The additional appropriation endorsed by Senator James E. Watson, was concurred in by the Senate and the money has just become available for the experimental work.

Latest information indicates that one of the experiments will be carried on in the area around Cornelia, Ga., and the other in the Vincennes, Ind., area.

OF all the experimental work which has been done for peach moth control, the bait-trap method offers the greatest hope for a solution of this very serious problem, and those in attendance at the horticultural conference in Washington were practically unanimous in their opinion that this method should be tried first over a large area and for several

## A NEW ORCHARD TRACTOR



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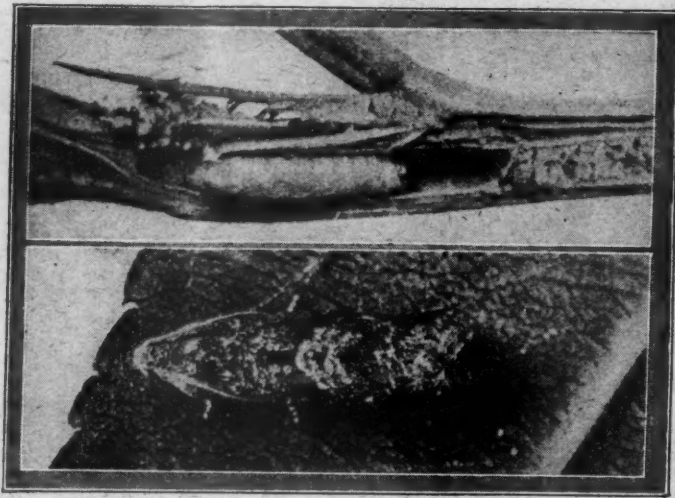
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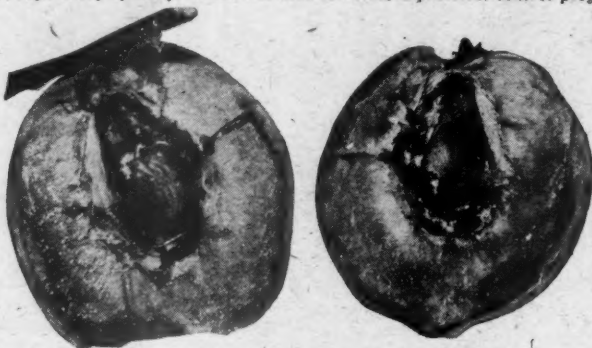
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The illustrations above (greatly enlarged, after U.S.D.A.) show, (upper panel) the larva feeding within the peach twig; (lower panel), the adult peach moth. Below, Peach split open to show larva feeding within. These illustrations graphically portray the difficulties confronting the peach grower in attempting to control this pest with poisons. The adult moth does not feed on the peach. The larva cuts away the surface of the twig but does not begin to feed until beneath the surface. The three projects now authorized will make a thorough study of the problem, and seek to create a practical control program.



Committee of both the House and the Senate.

THE plan for the experimental work provided for the use of bait traps in three separate areas, of approximately 500 acres each, where the moth was doing the greatest damage, and to use such other methods of control as had been demonstrated as being effective.

Conferences with the officials of the Bureau of Entomology indicated that it would cost about \$40,000 for each experimental area and that an additional sum of \$30,000 should be provided for other research work. Accordingly, the plan was completely outlined and a request for the appropriation of \$150,000 was to have been transmitted by the Secretary of Agriculture to the Bureau of the Budget.

In the first instance, the amount of the appropriation was reduced to \$60,000. It was later reinstated and sent to the Budget Bureau, where it received a similar tearing down and was sent to Congress as a request for \$60,000.

Through the kindly co-operation of Congressman Will R. Wood, of the State of Indiana, chairman of the Finance Committee of the House of Representatives, his committee, at the urgent request of representatives of the council, increased

years to determine definitely its value as a control measure.

The deciduous fruit industry should feel a deep appreciation for the work done by the National Horticultural Council in bringing about these results. The council was solely instrumental in procuring the Congressional appropriation for the work and its plan for the experiments received the whole-hearted approval of the Bureau of Entomology.

At last there is a hopeful outlook for the deciduous fruit grower for the control of this destructive pest. The moth has spread into every fruit section east of the Mississippi River, was active in eastern Arkansas last year, and was observed in a few orchards in Missouri.

Without adequate control methods which will be practical for the peach grower to use, the destruction of his crop value seems imminent. Losses to peach growers in 1929 because of the presence of worms in the fruit reached the enormous total of more than twenty million dollars.

THIS work by a fruit growers' organization indicates the need and necessity for national organized effort in dealing with such momentous problems. Where millions have been spent for the

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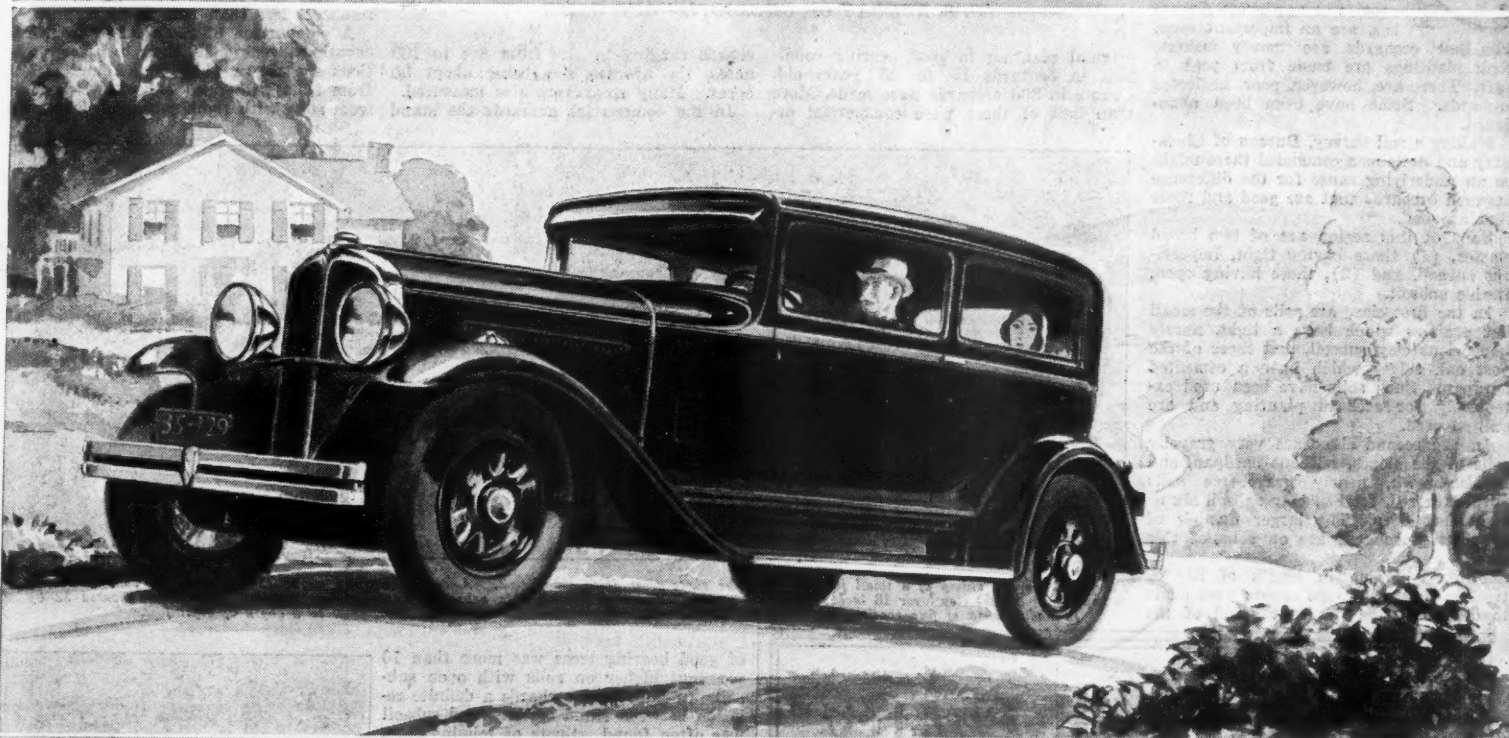
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# The New OAKLAND EIGHT

PRODUCT OF GENERAL MOTORS



Illustrated above: The 2-Door Sedan, Body by Fisher

*Throughout its long life  
you benefit by its economy  
and superior performance*

The engineers responsible for the New Oakland Eight laid special emphasis upon long life. They designed its 85-horsepower engine in a rigid, compact unit.

They equipped it with a short, sturdy

crankshaft, entirely free from torsional vibration within the speed range of the engine, and with large, durable main bearings. They made efficient oiling a certainty by means of full pressure lubrication. They provided generous water jackets to insure uniform cooling. All such advancements and more to make sure that your New Oakland Eight would stand up through years of the hardest driving. ♡ And these engineers were also mindful of economy. For the New Oakland Eight, with its full down-draft carburetion system and new duo-plane cylinder head, consumes no more gasoline per mile than many sixes of equal size and weight. This is especially remarkable in view of Oakland's superior performance—its impressive speed and snap, its nimble hill climbing and easy mastery of mud and sand. ♡ Let your Oakland-Pontiac dealer explain the other advantages offered to farm motorists by this lowest priced General Motors eight. Experience the pleasure of riding behind an engine which develops one horsepower to each 37 pounds of car weight. Enjoy the fine car comfort, the safety and the luxurious beauty of Oakland's sturdy wood-and-steel bodies by Fisher with their smartly tailored interiors and genuine mohair upholstery. However much you are impressed by a salesroom examination, it is only when you ride in the New Oakland Eight that you truly appreciate its merit.

**\$1045**

AND UP

Seven body types. Prices f. o. b. Pontiac, Mich., plus delivery charges. Oakland Motor Car Company

Write for an interesting booklet which illustrates and describes the design of the New Oakland Eight.

Remember... you can buy an Oakland on special G. M. A. C. terms offered to farm buyers exclusively, with payments at convenient intervals during the year.

Consider the delivered price as well as the list (f. o. b.) price when comparing automobile values. ... Oakland-Pontiac delivered prices include only authorized charges for freight and delivery and the charge for any additional accessories or financing desired.

*superior  
performance*



# SUBSOIL, A BIG FACTOR in APPLE PRODUCTION

By A. T. SWEET

U. S. BUREAU OF CHEMISTRY AND SOILS

APPLES, in southwest Missouri and northwest Arkansas, are an important crop. The best orchards are money makers. New plantings are made from year to year. There are, however, poor, neglected orchards. Some have even been abandoned.

Making a soil survey, Bureau of Chemistry and Soils men concluded there might be an underlying cause for the difference between orchards that are good and those that are bad.

Soils of this region are of two broad classes, (1) those having tight, impervious subsoil, and (2), those having open, friable subsoil.

In the first class are soils of the small flat prairies which have a tight, nearly impervious clay subsoil, and those of the post oak ridges which have a cemented hardpan. Such soils have been used extensively for orchard planting and are still so used.

In the second class are very gravelly soils of the slopes, without hardpan, and reddish-brown, nearly gravel-free soils with dark red, friable, clay subsoil six or eight feet deep. The larger number of the better orchards are on soils of this class.

For comparison in length of life of trees in the two groups counts were made to determine the per cent stand of the

original planting in good bearing condition in orchards 15 to 25 years old. Counts in 300 orchards were made. More than half of these were commercial or-

chards ranging in size from five to 160 acres, the average size being about 30 acres. Many trees were also measured.

In the commercial orchards the stand

found to a depth of six, seven and even eight feet. Owners of such orchards were surprised and delighted that roots of trees midway between the rows, planted 32 by 32 feet, grew to such depths (Fig. 2).

Conservatively estimated, trees of this age on such soils send their roots into and draw moisture and plant food from at least 5000 cubic feet of soil. Those on tight subsoil not only have smaller trunks and less limb-spread but also have soil resources less than half as great.

A comparison of roots taken from excavations, placed in their relative positions are shown (Fig. 3); A and D are from soils with open subsoils, B and C from soils with tight subsoils. Depth of

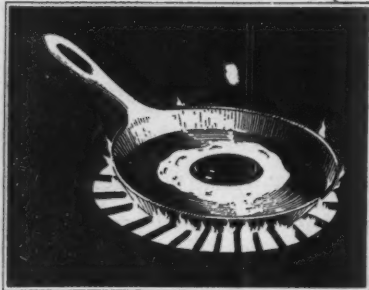


Fig. 1. Upturned stump of a small forest tree. The roots grew down to the top of a tight clay layer 18 inches below the surface. There they formed a mass of fine rootlets but could not grow deeper.



Fig. 2. A typical orchard about 23 years old on soil with open or friable subsoil. Roots midway between the trees, planted 32 by 32 feet, grew to a depth of eight feet.

## If you could Un-fry an EGG!...



.... then

Rain and wind could wash off KOLODUSTS



This, of course, is an extreme example. But everybody is acquainted with the fact that when an egg is once fried it cannot be changed back into its original watery form. The egg is what is known as an irreversible colloid... The super-active part of Kolodust behaves somewhat like the egg, for it too is a colloid of the irreversible type though to a less degree. And it is to this irreversible quality that Kolodusts owe their great sticking power.

### The New Principle

A patented process produces the super-active ingredient of Kolodusts, namely Bentonite-Sulphur, a finely divided dust obtained by blending and fusing Bentonite with high grade Sulphur. This material possesses three important qualities. (1) It is microscopically fine, and when wet liberates millions of invisible particles of pure sulphur. (2) When applied to the foliage Bentonite-Sulphur becomes

sticky and gelatinous, but (3) when once dried it is transformed into a colloid of the irreversible type, non-wettable, which will not be washed off.

From every quarter of the globe comes testimony to the effectiveness of Kolodusts. All kinds of orchards have been successfully guarded against the menace of fruit crops—and profits—this scientific way. Write for complete information.

NIAGARA SPRAYER AND CHEMICAL CO., Inc.

207 Elizabeth Street,



Middleport, New York

of good bearing trees was more than 10 per cent higher on soils with open subsoil. In individual orchards a definite relation between stand of trees and subsoil was often found. Spots of missing trees often correspond to spots of tight subsoil.

Variations in size of trees were even more surprising. On soils with open subsoil trees 20 to 25 years old which had received good care had trunks 12 to 13 inches in diameter at the base. On tight subsoil their diameter was only seven to 10 inches, with correspondingly smaller limb-spread.

Forest trees, pulled in highway building, showed roots checked by tight subsoil. Small trees at the edge of the prairies sent their roots down to the top of the impervious clay, where they spread out in a mass of fine rootlets (Fig. 1). Hardpan stopped them in the same way.

To find out how apple tree roots grow under the same conditions, excavations 30 by 48 inches were made, the walls extended straight down, the soil removed by layers and the roots carefully picked out and put into bags. Later these were washed, dried and weighed. Good vigorous trees 20 to 25 years old were selected and 40 excavations made. The greater number of these were beneath the outer limb-spread, usually 10 to 15 feet from the trunk of the tree.

Results were surprising even to experienced orchard men.

Roots of apple trees are as keenly sensitive to soil and subsoil conditions as plants above ground are to heat and light. They grow for long distances where conditions are favorable but refuse to grow where they are not.

In soils with tight subsoil, roots of any kind were rarely found deeper than 30 inches. Where the subsoil was open and friable, even if very gravelly, roots of trees of the same age and variety were



Fig. 3. A and D roots taken from excavation 30 by 48 inches and replaced in relative position from which taken, trees on soil with open subsoil. B and C from trees with tight subsoil. Depth indicated in feet in the margin.

the roots in feet is shown in the margin.

Furthermore, roots from open subsoils were, as a rule, found in a clean, healthy condition. In wet, poorly drained and poorly aerated subsoils, many small, dead roots were found and numerous others were in an unhealthy condition.

Adjustment of orchard plantings to soils best suited for the purpose, in this region where there is an abundance of such soils, would save many keen disappointments and enormous economic loss, loss in time, labor and money.

## Benefits Derived from Federal Farm Loans

By C. S. HALE

THE \$1,200,000,000 in first farm mortgage loans held by the 12 Federal Land Banks represents approximately one-ninth of all the farm mortgage indebtedness in the United States, and it also represents a much larger proportion of the total mortgage indebtedness which could be floated through the use of federal farm loans. The reason for this is that the Federal Land Banks lend only on first mortgages, and the total mortgage indebtedness of \$9,468,000,000 represents not only first mortgages but seconds.

Further, the bank cannot lend on those farms which are not operated by the owners. The indebtedness of the owner-operated farms amounts to only about \$5,560,000,000 and this includes second mortgages as well as first.

Thus, by sifting the figures somewhat, by elimination of those who are not eligible under the Federal Farm Loan Act, we find that the 12 Federal Land Banks hold a very respectable proportion of the amount of loans which it is possible for them to obtain. I do not mean by this

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that Federal Land Banks have not a field in which to operate for years to come—I am merely pointing out that in the 12½ years in which they have been doing business they have not been lax in carrying out the provisions of the act under which they were created.

#### Reduction of Farm Loan Interest Rates

**P**RIOR to the effective operation of the Federal Farm Loan System, interest rates on loans secured by farm mortgages most generally approached the maximum rate permitted under the laws of the various States. Where the interest rate was not the maximum permitted under the law, the brokerage or commission paid the agent of the lender by the borrower for securing the loan, generally equaled, and frequently exceeded, the maximum interest rate permitted. Such loans were usually made to mature within from three to 10 years, and when renewed, a similar commission or brokerage again had to be paid.

With the institution and operation of the Federal Farm Loan System, interest rates were materially reduced, the commission limited to a maximum of one per cent and the loan made for a sufficient length of time that the renewal was unnecessary. Under this system the principal and interest payable under the amortization plan is less than the previous prevailing interest rate, which enables the borrower to pay his loan off, including both principal and interest, at a less cost than the previous interest rate, thereby saving a sum equal to, and in many cases in excess of, the amount borrowed and the commission or brokerage paid in obtaining the loan. This has placed the cheapest money available within the reach of those engaged in the agricultural industry, at the same time surrounding the funds provided for this purpose with safeguards that prevent speculators from monopolizing the funds so provided, by limiting the amount that might be loaned to one individual, as well as limiting the loans to the class that was actively engaged in the cultivation of the land to be offered to secure the loan.

#### Enables Tenants to Become Farm Owners

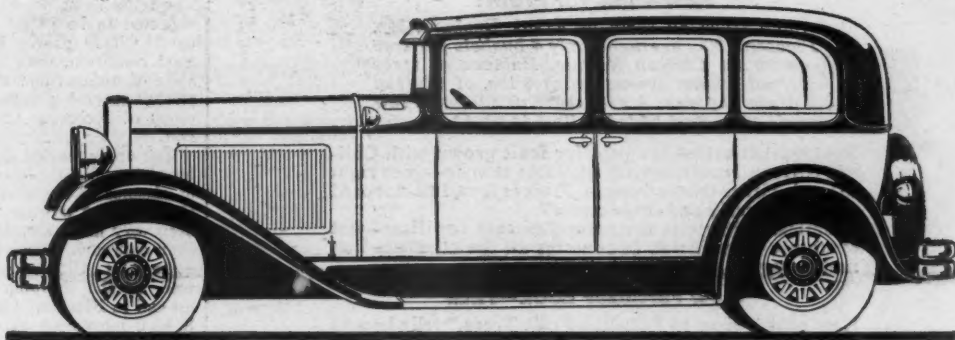
**T**HE Federal Farm Loan System enables many tenants to become farm owners, thereby enabling them to own their own homes. Long-time loans at a low interest rate have enabled many former tenants to purchase land and thereon establish for themselves a home. Being able to borrow one-half of the funds necessary to purchase under the liberal terms provided by the system has enabled many individuals to purchase farm lands and establish thereon homes. Many individuals were able to otherwise provide for one-half of the purchase price of the land desired for a home though were wholly unable to provide for the full purchase price. This system has placed within their reach the possibility of sooner acquiring for themselves a home. It has improved the condition in many communities, reducing the tenancy and increasing the home ownership, which has resulted in the development of many sections by improved local conditions, such as building better houses and barns, promoting the building of improved highways, making transportation and the marketing of farm products less expensive, encouraging soil improvement, the planting of orchards and the general improvement of the appearance of both the farm and the community.

#### Encourages Co-operation

**T**HE adage, "United we stand, divided we fall," is so familiar to the vast majority of people that it may be quoted without a realization of its significance, yet the suggestion without analysis brings to our mind the thought of co-operation. The farm loan system was founded, built and exists through co-operation. The borrowers co-operate in the organization of their association for the purpose of obtaining the funds. The 12 banks in the system co-operate in assuring to the investor the return of the funds invested in the bonds. The several banks guarantee the payment of the bonds of each. Experience has taught us that there is strength in unity. Prices are stabilized and strengthened through co-operation. During the past 12 years the farmers have learned and realized more of the benefits to be derived through co-operation than

(To Page 22)

# THE SAME SUPERIOR PERFORMANCE DAY AFTER DAY... YEAR AFTER YEAR



Nash engineering has created three new motor cars for 1930 that will not only outperform, but outlast any other motor car in their field.

Here are some of their superior features, and how they contribute to the permanence of the superior "400" performance:

**9 and 7 bearing crankshafts**—a big main bearing on each side of each connecting rod in the new Twin-Ignition Eight, Twin-Ignition Six and Single Six motors.

**Stronger Frames**—Tubular-trussed for extra endurance without extra weight.

**Centralized Chassis Lubrication**—Every shackle bolt and chassis bearing constantly lubricated without the bother of hand greasing.

**Lifetime Lubricated Springs**—in the Twin-Ignition Eight and Six—enclosed in flexible steel spring covers—to protect springs from mud, water, dust, and for finer spring action, forever.

**Built-in, Automatic Radiator Shutters**—Correct engine temperature, automatically regulated, saves wear and tear on Nash motors in extreme weather.

Any Nash dealer can show you that there is more quality, more value and better performance in the 1930 Nash "400" than in any other car at a similar price. (1707)

29 EIGHT AND SIX CYLINDER MODELS IN A PRICE RANGE FROM \$935 TO \$2385

## 1930 NASH "400"

TWIN-IGNITION EIGHT...TWIN-IGNITION SIX...SINGLE SIX

### "FRIEND"

Now offers a Duster!

A "Friend" Duster equal to the famous "Friend" Sprayers in mechanical ingenuity and perfection.



**SPRAYERS—DUSTERS**  
Spraying and Dusting  
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**"FRIEND" MFG. CO.,**  
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America's Finest Club Hotel  
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Room with Running Water, \$2.00 up  
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Ample Parking Space

### STANDARD GARDEN TRACTOR

A Powerful Tractor for Small Farms, Gardeners, Florists, Nurseries, Fruit Growers and Poultrymen.  
**DOES A MEN'S WORK**  
Walking & Riding Equipment  
Free Catalog—Does Belt Work  
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## Win Nash and \$500.00!

To advertise we are going to give over \$7400.00 in prizes. Lewis Link, over 70 years old, won Nash in recent offer; Joseph Hamilton, 18 year old boy, won Nash; I. A. Nystrom won Buick and \$500.00, took all cash. Win Nash or \$1885.00.

### FIND THE DIFFERENT AUTO

Be careful! Don't make a mistake. The real Nash I am giving away is different from all the others. Difference may be in headlights, headlight braces, bumper, tires or radiator. Send number of different car or mark it on picture and send to me. 7 automobiles—total of 24 prizes this time and duplicate prizes in case of ties! Send no money. If correct, you will be qualified for this opportunity.

### \$500.00 FOR PROMPTNESS

—making total prize you can win \$1885.00, all cash if preferred. Find different auto and send answer today. First prize winner gets \$500.00 cash just for promptness. Nash. ARTHUR MESKE, Dept. 150, 510 N. Dearborn St., Chicago, Ill.



\$486 in Prizes!

Reply Today!

# WAKE UP those SLEEPY APPLE TREES

Your apple trees are apt to get lazy. A heavy bloom is only half their job. Don't let them loaf along. Set the bloom and make the crop with Chilean Nitrate of Soda. It is just the plant food needed to make sure of large, juicy apples.

## How's This for Profit!

Apple trees on farm of Frank Beshare, Mt. Pleasant, Pa., averaged only 4 bushels per tree—with no Chilean Nitrate. Balance of trees yielded 7.9 bu. average with 4 lbs. of Chilean Nitrate per tree. A difference of 3.9 bu. A few cents extra cost added dollars to profit.

Best market prices are paid for fruit grown with Chilean Nitrate. Its nitrogen is available at once—goes right to work. Gives trees strength. Fruit is firm, full-flavored—matures early and ships better.

Chilean Nitrate is the natural nitrate fertilizer—not synthetic or artificial. It contains all the elements that nature gave it, including iodine.

## New Fertilizer Book—FREE

New book, "How to Fertilize Fruit Trees," tells how to use Chilean Nitrate of Soda to make apples and all other crops more profitable. Free. Ask for Book No. 13, or tear out this ad and mail it with your name and address written on the margin.

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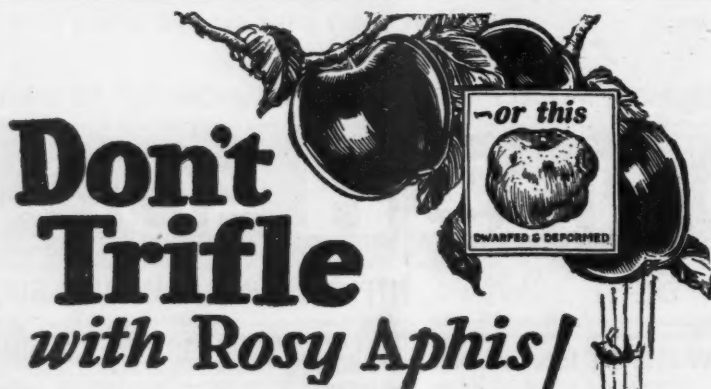
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In replying, please refer to Ad No. 36-C

1830-1930—one hundred years of service to American agriculture



Remember the clusters of undersized apples that decorated your trees in Aphis years! From 20% to 60% of the crop may be injured by Rosy Aphis. "Black Leaf 40" protection costs only a few cents per tree. Experiment Stations recommend 1 pint of "Black Leaf 40" to 100 gallons of Lime Sulphur spraying solution at the delayed dormant stage. This ONE spray positively controls Rosy Aphis and protects against Scale, Scab and early worms. If you use Oil Emulsion for Scale and Red Mite, add "Black Leaf 40" to control Rosy Aphis. "Black Leaf 40" kills insects by direct contact (wetting) and by its nicotine fumes.

## ASK YOUR EXPERIMENT STATION

Tobacco By-Products & Chemical Corporation  
Incorporated  
Louisville, Kentucky

**"Black Leaf 40"**  
40% Nicotine



# The Market Review

By PAUL FROEHLICH

United States Bureau of Agricultural Economics

**COLD WEATHER** in February and early March probably did some damage to peaches in the Ohio Valley and the Middle West and possibly in the Pacific Northwest. Conditions in the Southeast were still fairly favorable, low temperatures probably benefiting the crop in most places, rather than harming it. Early varieties of peaches in Georgia were in full bloom, much earlier than usual, and were probably damaged to some extent. The season's shipments from Georgia are expected to be between 7000 and 10,000 cars. Citrus groves in Florida were in good condition, with a heavy bloom. In spite of unfavorable weather in some districts, general prospects are for larger crops of deciduous fruits this year than last.

The apple market during recent months has been slightly disappointing, because of absence of the usual price advance for stock out of storage. Price gains have been very moderate, and considerably less than expected. Strawberries had declined quite a bit. Citrus-fruit values held fairly well, as the shipping season approached an end in Florida. Chiefly because of the lighter movement this season of apples, citrus fruits, early cabbage and old potatoes, combined forwardings of the leading fruits and vegetables in mid-March were averaging only 2050 cars daily, compared with 2400 each day during the same period in 1929.

## Citrus Season Extended

**MOVEMENT** of Florida citrus fruit will be extended to April 15, by permission of quarantine officials, and thus a larger portion of the crop than first expected will be sent to market. This may also relieve pressure on the canning situation, so far as grapefruit is concerned. Latest reports indicated that the pack of Florida grapefruit might reach the high total of 1,500,000 cases, and the market situation was causing some concern. A recent press item gives an estimate of 300,000 cases of grapefruit to be canned in Porto Rico this season. Canners are said to have been offering growers as much as \$30 or \$35 per ton.

Carlot movement of grapefruit was decreasing during March, and recently averaged only 75 cars each day. Florida was the only shipping State of any importance. Movement will be quite limited from now to the end of the season. Though about one-third lighter than a year ago, shipments of oranges still averaged 225 cars daily, with Florida and California on an almost equal basis as originators of this fruit. Mixed-citrus shipments had decreased to 40 cars a day.

## United Kingdom Fruit Supply

**THE** estimated per capita consumption of fresh fruits in the United Kingdom during 1929 was about 82 pounds, compared with 68 the year before and an average of 74 pounds for the period from 1924 to 1927. The figures include fresh fruits for all purposes, including commercial preserving and canning. Fluctuations in the per capita consumption are due mainly to changes in the local or domestic production of fruit within the United Kingdom. In the past six years, imports of fresh fruits have averaged about 75% of the total consumption of these products. Apples are imported most largely from the United States, Canada, and Australia. Grapefruit also comes mainly from the United States and Porto Rico, as well as the British West Indies. Among the principal imports in 1929 were 97,000,000 pounds of grapes, 57,000,000 pounds of plums, 15,000,000 boxes of oranges, 15,000,000 bunches of bananas, and more than 13,000,000 bushels of apples.

## Barreled Apples in Demand

**BECAUSE** of the relatively light supply of barreled apples, prices in the British market have recently been well above those of a year ago and ranged mostly \$6.40-\$10, with Virginia Albemarle Pippins bringing the highest price. Western boxed apples, Extra Fancy grade, sold on the Liverpool auction during early

March at \$2.50-\$4.60, with Oregon Newtowns holding top place. Winter Nelis pears from Washington were bringing nearly \$4 per box in Liverpool.

The exportable surplus of apples in Australia and New Zealand this spring will be large. Total shipments from those countries are expected to be double the quantities exported last year and may exceed the high record of 1928, when aggregate shipments were nearly 5,000,000 boxes. American fruit may find rather limited sale in Europe after April 1. New Zealand alone expects to ship 1,200,000 boxes of apples this season, or fully 50% more than during either of the last two years. Shipments of pears from Australia and New Zealand are also likely to exceed the figures for 1929 or 1928. Total movement of pears may be 300,000 boxes.

## Domestic Apple Markets Dull

**THE** domestic market for American apples has not shown as much life as desired. Trading has been rather slow, and prices have failed to show as sharp an upward trend as usual. Best Baldwins still returned \$2 per bushel basket or \$5.50 per barrel at western New York shipping points, with Ben Davis at \$4.25 a barrel. In the Pacific Northwest, Extra Fancy, medium to large Winesaps sold on an f.o.b. basis at \$1.75-\$1.80 per box and Delicious ruled \$2.90. These western prices are slightly lower than those of the month before.

An exceptionally active movement of apples occurred from the State of Washington during the closing week of February, but the Washington forwardings have since decreased to less than 50 cars daily. In early March, shipments from eastern producing areas were heavier than those from the West, the combined total being only 1000 cars a week or one-fifth less than during March, 1929.

An interesting study of the British market was recently completed in New York State: Records on 25 carloads of western New York apples shipped to Great Britain last season show a net return to the shipper of \$3.59 a barrel, according to a study by Cornell University. The freight to New York City was 51c and the ocean freight was 90c a barrel. Including the freight, the total shipping-charges were \$2.19 per barrel. The first of the apples were shipped December 17, and the last on March 25. The date of sale in Great Britain varied from 12 to 25 days after shipment. Checks for the goods were received from 23 to 46 days after shipment. Prices varied according to variety, grade, and market conditions, but the expenses were about the same on all shipments. During the last seven years several shipments have failed to pay expenses. Most of the apples shipped were Baldwins, but a considerable quantity was made up of Greening, Ben Davis, Russet, King, and Stark.

## March Holdings of Apples

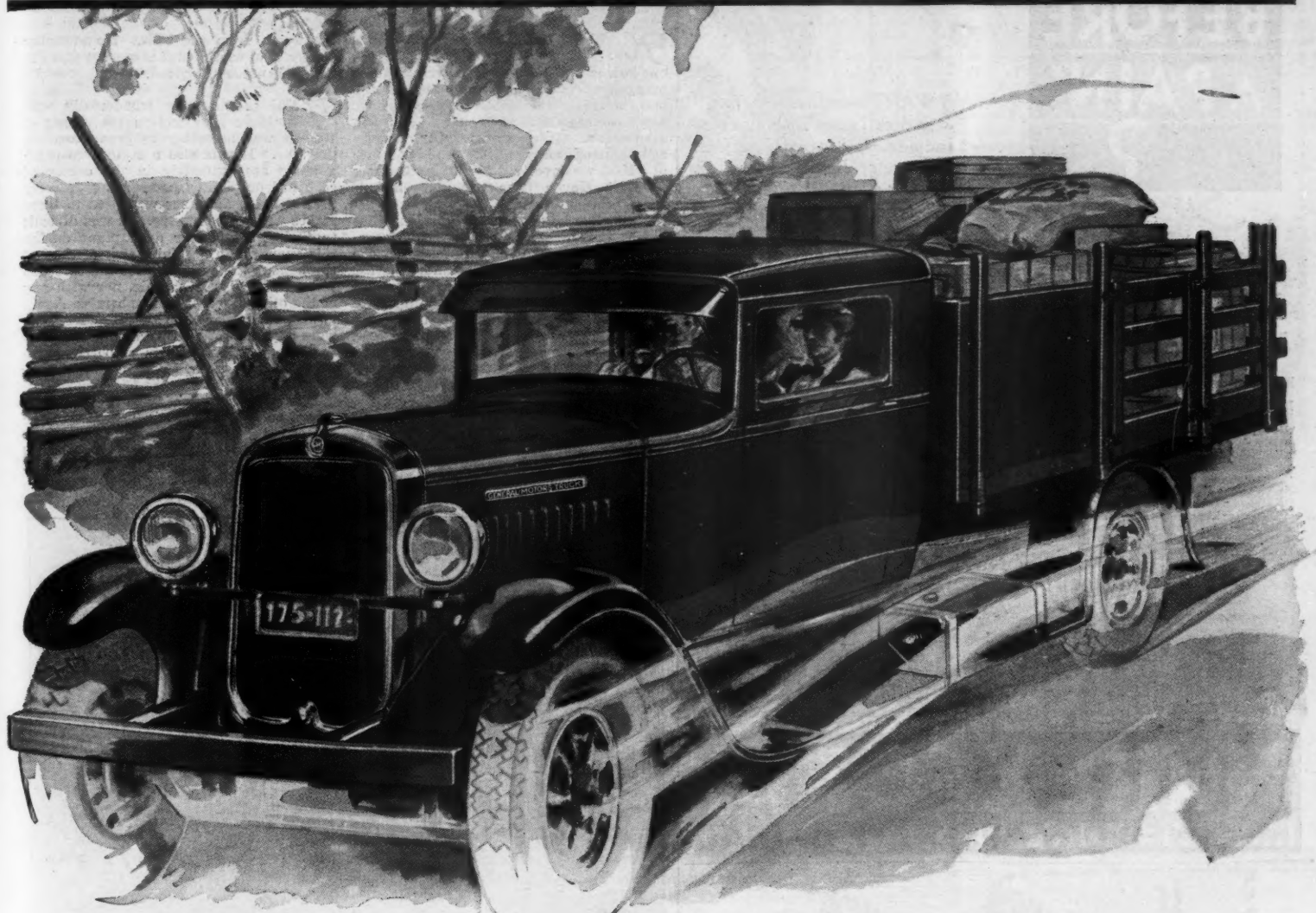
**BY** March 1, the cold-storage supplies of apples had diminished to 883,000 barrels, 7,271,000 boxes, and 2,734,000 bushel baskets. The combined holdings under refrigeration were about 7% less than last year at this time and approximately 6% below average holdings for March of the past five years. Barrels were 46% less plentiful than average, and 22% short of last season's holdings in this type of container. Boxed apples were 9% below the figure for 1929 but were slightly above the average figure. Pacific Coast storages still had about 5,100,000 of the total 7,271,000 boxes. Bushel baskets under refrigeration were 26% more abundant than on March 1, 1929, and 94% above average holdings.

## Berry Season Active

**ABOUT** the last of February, an editorial in a prominent Florida paper described the activity in the strawberry market as follows:

"Plant City section of Hillsborough County is making and then breaking records this season with the little red berry (To Page 22)"

# GENERAL MOTORS TRUCKS



## A RECORD-SETTING VALUE

now added to **GENERAL MOTORS TRUCKS** for farm use

**LOOK** at the frame of this truck—6' pressed steel channel. Get back of the wheel, and tap some of the power and speed in this 58 horsepower, 6-cylinder engine. Put it up against the worst road in your neighborhood, or the stiffest grade.

Slam on the four-wheel truck brakes you have here—developed by a full year of testing. Feel the new ease and sureness in steering.

Check up the value, dollar for dollar—this truck against any other. Check up the power per hundred pounds of weight.

It's a newly added model in the 1930 General Motors Truck line, specially and accurately suited for all average farm hauling. There are no fundamental changes from the proved principles that are earning profits for thousands of American farmers today.

**\$745**  
**1 Ton Range**

Model T-17A; STRAIGHT RATING  
6,500 lbs. (total gross weight,  
including load); price chassis  
only, f. o. b. Pontiac, Mich.

1930 General Motors Trucks include 5 other models, 14 other chassis, and 56 other types that are well suited to farm use.

Only real leadership in engineering and manufacturing could offer such a line of trucks at anything like these prices.

You'll do well to find out, first-hand, all about this great truck. Ask for a real demonstration, which your nearest General Motors Truck representative will gladly provide. (A postcard will bring you his name and location.) Investigate, right now, what General Motors has—before you buy!

Purchase of any General Motors Truck is made easy. Time payments are financed at the lowest available rates through our own Yellow Manufacturing Acceptance Corp'n.

A General Motors Truck is never more than a few hours away from competent service, and full parts-stocks, when needed.

**GENERAL MOTORS TRUCK COMPANY**  
Pontiac, Michigan (Subsidiary of Yellow  
Truck & Coach Mfg. Company) **GENERAL**  
**MOTORS TRUCKS, YELLOW CABS, COACHES**  
Factory Branches, Distributors, Dealers—  
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Following is a few of the complete line of REX Spray materials:

REX Lime and Sulphur Solution  
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 REX 80-10-10 Sulphur Lead Dust Mixture  
 REX Copper Dusts  
 REX Sul-Powder (substitute for self-boiled Lime Sulphur)  
 REX Calcium Arsenate  
 40% Nicotine Sulphate, Sulphur



**I WANT to emphasize the fact,** writes James B. Hamer of Indiana, "that your Nurexform Arsenate of Lead will stay on after a rain and bring almost 100 per cent clean fruit."

Don't pay a penalty for using ordinary lead arsenates. Make every penny you pay . . . every hour you spray . . . count in more sound fruit. Use NUREXFORM. Defies rain and wind because it sticks. Leaves no unprotected gaps because it covers completely. Does not clog screens and nozzles because it does not settle to the bottom of the tank. NUREXFORM stays where it is sprayed.

Don't spray another drop of material until you have fully investigated NUREXFORM and other Rex Spray materials. Send for circulars. Address your nearest Rex company.

The Toledo Rex Spray Company, Toledo, Ohio  
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## NUREXFORM IMPROVED DRY ARSENATE OF LEAD

If  
you  
solve  
this  
SIMPLE  
PUZZLE



**— YOU WILL QUALIFY —  
for the Opportunity to Win \$2035**



Any person living in the United States outside of Chicago may send an answer to this puzzle, except employees of our company or their relatives; winners of automobiles or first prizes in any of our previous offers, or their relatives. Send your answer TODAY.

To advertise our business we are giving away 150 prizes—the first prize is \$1,330.00 and \$705.00 extra, making a total of \$2,035.00 in cash, or, if you wish, a new Buick 4-door Sedan and \$705.00 extra in cash. There are many other valuable prizes, including automobiles and cash prizes. A total of 150 prizes altogether and duplicate prizes will be paid in case of ties.

### FIND THE TWIN FLYERS

Grouped about this advertisement are eight pictures of a famous woman flyer. Two of these pictures are just alike. All the others differ in some detail. If you can find the twins—the two pictures that are exactly the same—just send their numbers on a post card or letter along with your name and address. Study carefully the helmets, goggles, chin-straps and coat collars. Send your answer with your name and address right now, today! That's all.

### \$705.00 for PROMPTNESS

We are not only giving the 150 grand prizes totaling thousands of dollars, but are also giving an additional \$705.00 in cash for promptness to the winner of the first prize if he or she has been prompt. Thus the first prize winner will receive the new Buick Sedan and \$705.00 in cash, or \$2,035.00 in cash. Winner's choice. There is no obligation. Nothing for you to buy, now, later or ever. No more puzzles to solve. Send no money, but qualify today. ANYONE WHO ANSWERS THIS PUZZLE CORRECTLY MAY RECEIVE PRIZES OR CASH.

B. A. BLACK, Advertising Manager  
 Dept. 423, 524 N. Dearborn St., Chicago

## MORE THAN \$1,000 from an ACRE of RASPBERRIES

By ALBERT E. WILKINSON  
 CONNECTICUT AGRICULTURAL COLLEGE

**HOW WOULD YOU** like to take \$1653 from approximately one and one-half acres of red raspberries? Not many growers are able to do this. Only once before in the history of Connecticut has a grower obtained \$1000 an acre from raspberries. This was a number of years ago. During the year 1928 the high figure of \$1653 was received by Kuen Brothers of East Haven from one and one-half acres of this fruit.

Kuen Brothers searched for a long time before they could find disease-free raspberry plants. At last they located some State and federal certified plants (disease free) in the hands of a nurseryman in Bridgman, Mich. They would not have purchased the berries unless they were certified and as disease-free as plants can be. This was indeed a wise move on their part as after three years of growing the crop, very little disease has shown up.

**SEVENTY-SEVEN** hundred plants were purchased from this nursery. Of these 2200 were of the St. Regis variety, an everbearing type of red berry which was discovered years ago by the

the weeds from the hills. No spraying of any kind was needed nor given and has not been needed or given.

**THE** plants grew wonderfully well the first year and in the spring of 1927 it was necessary to prune some of the tops. It was also necessary to place a stake approximately in the center of each hill or plant. After being properly pruned back, the vines were tied to these stakes with tarred twine. It was difficult to find a skipped or dead plant during this year, and a careful watch of the bed throughout the year did not indicate one plant troubled with mosaic, nor with any of the other diseases of raspberries. Again 1000 pounds per acre of 5-8-7 fertilizer were applied. The crop came on and during this year \$700 worth of berries were sold. This, of course, was not the heaviest yield.

During the spring of 1928 the vines had grown so heavily that in addition to the old canes, a number of the newer canes were removed. Each plant was pruned down until only five canes remained. These canes were not topped until after the



Good plants, large growth, profitable yields.

Rennere family of Hammon, N. J., the name being changed by nurserymen in later years. This variety produces good sized, deep red berries of fair to good quality. It has a relatively long picking season as it is an everbearing type, and on the Kuen Brothers' farm it is very productive. Five hundred plants were of the King variety. The King produces a much lighter colored berry of a little larger size and from all appearances it is very similar to the Latham. It is not, however, as productive nor as attractive as the St. Regis.

These plants were purchased in the spring of 1926. On their arrival they looked rather small and insignificant to the Kuen Brothers and they were very much in doubt that they would live. However, they had selected a good, well drained, loamy soil, of the light type rather than the heavy, cold, slow soil, and this soil was prepared in a very careful manner, that is, it was plowed deeply and harrowed until in a very fine condition. The land was marked out in squares five by five feet and at the intersection of the mark, a plant was set. It is readily seen that the hill system of growing the plants was used instead of the matted row system.

During the first year liberal fertilizing was given to the plants, approximately 1000 pounds of 5-8-7 fertilizer being used per acre. This was broadcast and worked in with a cultivator. The plants were cultivated during the season inasmuch that no weeds were allowed to grow. It was necessary to cultivate the plants only three times, twice in the row, both ways. Two men in two days, hand hoeing, freed

plants had indicated green growth. Then they were cut back to approximately four and one-half feet. Again they were tied with the tarred twine to the stake.

A similar fertilizer was applied during this year as in previous years. The plants grew wonderfully well, throwing out quantities of fruiting wood and indicating quite clearly that 1928 would be a bumper year in fruiting. It was. One hundred and seventy-four crates of 60 pints each were sold from this patch at an average price of \$9.50 per crate, or a total of

## CAL-MO-SUL

Calcium-Mono-Sulphide

**THE SUPERIOR and SAFE  
FUNGICIDE  
FOR APPLES and PEACHES**

**TRIED, TESTED, PROVEN  
AND  
RECOMMENDED BY**

The Virginia Agricultural Station, also by many of the leading fruit growers. Send for literature on last five years' results.

MANUFACTURED BY  
**THE CALCIUM SULPHIDE CORP.**  
 Damascus, Virginia

Sole owners of exclusive rights under usage, patent pending

\$1653. The price varied from \$9 per crate to as high as \$12 per crate.

THE Kuen Brothers have a unique way of harvesting their crop. There are three brothers, so one is always with the pickers. Neighbor boys are obtained for the picking work. These boys are paid from 90 cents to \$1.25 per day of eight hours, the average pay being \$1 for this time. They are never allowed to be alone in the patch. One of the Kuen brothers is always present. In fact, he works always in the middle of the group, watching, jollying, directing or helping. It costs \$210.15 to pick the berries.

It required 10,440 pint baskets at \$9 per thousand or \$95 in which to place these berries. During the picking season a very heavy rain and strong wind storm occurred and at least 12 crates of berries were lost during these few days, partly by the berries being over ripe before they could be picked and partly because they were blown or knocked off and were therefore of no value. All berries are sold in the city of New Haven, the demand for the product being way beyond the supply. In fact, Kuen Brothers last year had the market very much to themselves for high quality, locally produced red raspberries.

IT is of interest to summarize the various amounts that enter into the question of costs. This will include growing as well as selling. They are as follows:

During the year 1928 pruning and tying required three days for three men, eight hours a day. This would be \$36.

Fertilization, that is, applying the fertilizer, one-half day for one man, \$2; 1500 pounds of 5-8-7 fertilizer, \$25.75.

Tarred twine, \$19.50.

Cultivating, three times twice in the row, both ways; three days for one man and one horse, \$24.

Hoeing, two days, two men, \$8.

Picking by the boys, 28 days, and one man with them all the time, \$210.15.

No spraying of any kind was done since these berries were planted.

One hundred seventy-four crates at 15 cents, \$26.10. Ten thousand, four hundred and forty pint baskets at \$9 a thousand, \$95.

Use of land, \$37; use of tools, \$5.00. Marketing, \$140.

Total cost, \$628.50. Net profits, \$1024.50.

The total amount of land used contained 67,500 square feet. This is approximately one and one-half acres. It is a record.

### Building Up Orchard Soils

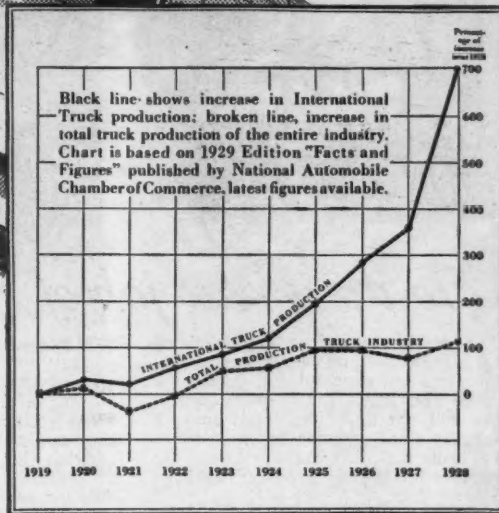
THE AVERAGE orchard soil is fertile enough to provide good growing conditions for most fruit trees, provided the orchard is given eight or 10 cultivations during the spring and early summer. The time the trees need lots of food, as well as cultivation, starts when the orchard is old enough to produce heavy crops of fruit. Unfortunately, many orchard sites do not have sufficient plant food in the form of organic matter to provide the trees with sufficient food for maximum production or annual crops when that stage is reached. This means that production is bound to be subnormal unless this very necessary organic matter is supplied. It is very expensive to provide this in the form of barnyard manure and no form of commercial fertilizer will entirely fill the need.

The wise grower takes these facts into consideration while his orchard is young. He makes every effort to build up the organic content of the soil each year in addition to giving sufficient cultivation to encourage a good yearly growth of his trees. Soy beans or cow peas are excellent soil builders and can be planted in late June after the most important cultivation is over. If there is a possibility of the trees receiving too much of a check by stopping all cultivation that early, a wide enough strip can be left around each tree row to allow for a few later cultivations. The bean or pea crop can be harvested if necessary and the straw put back on the ground and still the orchard soil will be built up. Usually the crop is left on the ground as a winter mulch but some growers prefer to disk it down in the fall and sow rye for the winter cover crop.—C. L. Burkholder, Purdue University.



This is the "SIX-SPEED SPECIAL" see description below

## This CHART Shows the Wonderful Growth of INTERNATIONAL POPULARITY



BACK in 1919, International trucks were already very popular. In that year International Harvester was already building many thousands of trucks.

Yet that was only a start. See what has happened since 1919. Although the manufacture of all trucks has only DOUBLED in the ten-year period, the manufacture of Internationals has multiplied SEVEN FOR ONE. The lines on the chart above show clearly how the need for low-cost hauling has brought people to International trucks.

There can be no better recommendation than this, for the proof of the pudding is in the eating. The proof of complete hauling satisfaction is in the hands of the truck owner. Today you can see the proof of International success everywhere on the roads.

On such evidence, do your own hauling by International. Choose your truck from this line: the Six-Speed Special shown and described here; the Speed Trucks, 1 1/4, 1 1/2, 2, and 3-ton; and the Heavy-Duty Internationals, 2 1/2, 3 1/2, and 5-ton. A Company-owned branch nearby, or a dealer still nearer, will give you the best of service. Write us for a catalog.

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606 So. Michigan Ave. OF AMERICA (Incorporated) Chicago, Illinois

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Transient Rates \$2.50 to \$4.50 a day. Attractive Kitchenette Apartments Beautifully furnished as low as \$100 a month.  
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**CHICAGO**  
Write for folder STILES MANAGEMENT

510 pages  
5 1/4 x 8  
\$3.00

... "Worthy of being in the hands of every professional horticulturist and practical fruit grower."

### Growing Tree and Small Fruits

By H. B. KNAPP and E. C. AUCHTER

This new volume in the Wiley Farm Series is a comprehensive and practical discussion of the principles of economical fruit production. Such subjects as the following are treated authoritatively: harvesting, storing and marketing; establishing the orchard; pruning; controlling insects and diseases; propagation; orchard soils and fertilization; thinning; growing strawberries, grapes and bush fruits.

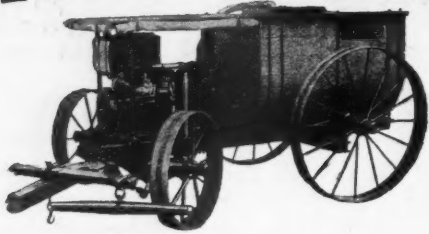
The material has been arranged on a seasonal basis, presenting each operation in the order in which it would occur in practice. The community studies concluding each chapter give valuable information on the practice of the local area.

**AMERICAN FRUIT GROWER MAGAZINE**  
53 West Jackson Boulevard, CHICAGO, ILL.

Gentlemen: Please send me Knapp and Auchter's "Growing Tree and Small Fruits". Herewith is my check (or Money Order) for \$3.00.

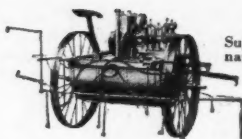
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The Hardie No. 12 Mogul, built for the hardest service

Spray Ring Special, light, low-priced, but powerful and dependable



Superior Combination Row and Orchard Sprayer—two big machines in one

### To do a real job of spraying

The grower who does a real job of spraying is the one who makes money on fruits and vegetables in both good years and bad. Weak, puny sprayers will not do. The small sprayer for the small grower must measure up to its task just as fully as the big sprayer for the big grower. And the Hardie does.

There are exclusive, patented features of design and construction in the Hardie sprayer that mean better spraying for less cost. The Hardie pump today is the super-achievement

of 30 years of intensive specialization in spray pump building. These price-less features are vividly apparent to the man who will spend a little time studying the sprayer specifications. They appeal to the grower who realizes that the capacity, pressure, power and durability of his sprayer determine his profit and the reward of his labor. Get the facts about the Hardie. Made in stationary, tractor driven, power and hand models for every orchard and field requirement. Write for catalog.

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Managing proprietor: G. Zorn

## A Portable Burner for Prunings

By M. B. CUMMINGS  
UNIVERSITY OF VERMONT

A PORTABLE BURNER for orchard prunings, as shown in the accompanying picture, has been devised by J. W. Collins, superintendent of the 200 acres of the Connecticut Valley Orchards Company, Westminster, Vt.

The burner is made of sheet iron in the form of a rectangular box built on shoes

carried with the outfit for the removal of ashes.

Prunings can be burned with this outfit as fast as two men can gather them. This burner saves a lot of time as the brush does not have to be hauled to a point where a bon-fire can be made.

A floor is built of corrugated roofing to



Portable home-made brush burner for orchard prunings, designed by J. W. Collins, superintendent of Connecticut Valley Orchards Company, Westminster, Vt.

or skids. It is four feet wide, seven and one-half feet long, and two and one-half feet deep. Angle irons or second-hand pipe one and one-quarter inches in size hold the iron box together. A door is cut in the back end for convenience in hauling out coal and ashes. A hoe attached to a piece of three-quarter inch iron pipe is

prevent the burning of grass near the burner, but a supply of water and a sprinkling can are carried at the rear of the outfit to quench any fire that may start.

The burner is not very heavy and can be hauled anywhere in the orchard by horses, tractor or truck.

## Eighty-Three-Year-Old Fruit Grower Shows Way to Profits

By F. L. CLARK

EIGHTY-THREE years old and still actively caring for a fruit farm of four acres of apples and three acres of grapes is Charles H. True, Edgewood, Iowa, vice president of the Iowa State Horticultural Society. Last year he journeyed down to the Iowa State Fair, the same as he has for 22 years, and carried off many first and second prizes on his fruit, just as he has done every year his fruit has been exhibited.

But the best feature of growing extra fruit in a section where almost all other farmers are growing corn, hogs, and cattle is the home market, Mr. True has found. He doesn't have to haul away a single basket of grapes nor a box of apples. Every bit of his fruit is sold right on the farm. People motor in from a region of 30 and 40 miles around.

His early grapes are sold by the basket. Then each fall Mr. True advertises a "Grape Day." When the day arrives, cars are parked in a long line at the True farm before six o'clock in the morning. People bring shears and baskets. Mr. True turns them loose in his vineyard, to pick all they want, at so much a pound, usually four or five cents. The only stipulation is that they pick clean, green ones and all.

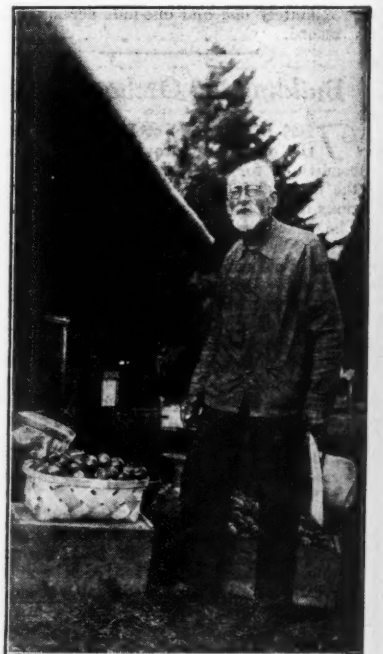
His windfall apples are sold in a similar way. People are allowed to gather them at the rate of a cent a pound.

Mr. True has found topworking his apple trees a protection from winter killing. He grafts on the Virginia crab, a hardy variety. Two years ago he used bait pails for insects, and found them very helpful. He did not use them last year, because of the wet spring, which delayed work in the orchard, but is planning to hang them in his apple trees this spring.

Out of 40 years experimenting with the best varieties for northeastern Iowa climate, he has now a six-year-old orchard which he believes is the best from an all around standpoint for his particular region. The varieties are Jonathan, McIntosh, Stayman Winesap, Minkler, and Delicious.

Mr. True has the distinction of being the only farmer in the northeastern cor-

ner of Iowa who is growing fruit exclusively. He makes a good living off of



Charles H. True, Edgewood, Iowa, 83-year-old prize fruit grower.

his seven acres of apples and grapes, while other farmers all around think a farm of 100 to 160 acres none too small for profitable agriculture.

The common lilac should never be planted with other shrubs in groups, according to South Dakota State College extension specialists. It should be used alone. Lilac plants sucker freely and will crowd out other shrubs. The other plants cannot compete with them.

## West Virginia Orchard Company Incorporates

A CHARTER has been issued by George W. Sharp, Secretary of State, to Romney Orchards, Inc., Romney, W. Va.

Its objects and purposes are to buy, raise, own, operate and sell orchards and orchard property; to operate apple and peach orchards; to own land, buildings and houses in connection therewith; to make, buy, sell machinery and equipment used in connection with apple and peach orchards; to buy, build, operate and maintain coöperage shops; to buy, make and sell barrels, baskets and coöperage supplies; to buy and sell timber lands and lumber for general building purposes; to make, buy and sell spray materials; to buy, build and operate storages for fruit; to buy and sell apples and all kinds of fruits and to do all things proper and incident to the operation of a commercial orchard; to mortgage or rent any of the real estate owned by the corporation and to have all the rights and privileges requisite for the purpose of its business and all incidental powers, pertinent, convenient or useful to said corporation in the conduct of its business.

The corporation has been capitalized for \$100,000 by Edward Miller, of Romney, and Thomas B. Byrd, H. F. Byrd, L. D. Arnold and H. B. McCormac, all of Winchester, Va.—B. J. Smith, West Virginia.

## Phony Peach Disease Infection Decreasing

ONLY 79,847 peach trees out of a total of 9,161,373 in Georgia were found to be infected with the phony peach disease during 1929, after a thorough inspection by the United States Bureau of Plant Industry, it has been announced by Manning S. Yeomans, State entomologist.

More than a million trees were inspected in Jones county and only 3000 trees were found infected with the disease. The largest infestation region was reported in Houston county where, out of 82 orchards visited, a total of more than 20,000 trees had the disease. On the other hand, no infestation was found in the following counties: Pickens, Polk, Stevens, Taliaferro, Walton, White, Barrow, Dade, DeKalb, Gordon, Greene, Gwinnett and Hall counties.

Eighty-two counties in the State, containing a total of 1574 orchards, were visited by inspectors. W. F. Turner of the United States Peach Disease Laboratory at Fort Valley, Ga., supervised the inspection.—J. H. Reed, Georgia.

## Ohio Fruit Grower Designs Hose Swivel

THE LATEST improvement in spray equipment is a spray hose swivel brought out by a reader of AMERICAN FRUIT GROWER MAGAZINE, A. B. Todd, Vermilion, Ohio. The swivel joint consists of a finely tooled universal ball joint which, connected between the spray gun and hose, permits the gun to be easily turned in any direction, thus avoiding hose kinks.

Ohio growers who are using Mr. Todd's invention speak very highly of it, stating that it obviates much of the muscular labor connected with the operation of a spray gun under high pressure, and encourages a better job of spraying.

## Oriental Fruit Moth Traps

TRAPS baited with a solution of molasses or sugar and water have been found promising as a control measure for oriental fruit moths in tests conducted by the United States Department of Agriculture. The addition of small quantities of aromatic chemicals, such as citral, increased the effectiveness of the traps about three times. Glass containers of one-quart capacity were used for traps. Since there is no effective insecticide control for this pest, further tests will be made with the baited traps.

This pest, since its discovery in the United States some years ago, has spread well over the peach-growing regions east of the Rocky Mountains and is causing serious damage to peaches, infesting both twigs and fruits.

# Think of Your Harvest Now

## The Fight is on

From calyx or petal-fall spray time on, you growers are fighting for a quality harvest. Even beyond the picking cost, remember it costs more to grade a 60% crop than it does one that rates 90%.

On apples you'll profit by making your calyx application the most thorough you know how. Thorough applications now will prevent the second and third brood codling moths.

Start early, using A S P Dust, or "Orchard Brand" Arsenate of Lead with "Dritomic" Sulphur. The fungicidal value of sulphur makes it an essential of every growing season application. There is no extra labor cost and no trouble in mixing.

In a season of over-production, QUALITY alone finds a ready market and pays a profit.



USE "ORCHARD BRAND" MATERIALS

ARSENATE OF LEAD  
ARSENITE OF ZINC  
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CALCIUM ARSENATE  
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Heavy duty for stationary spraying. Capacity, 55-60 gal. per minute. Pressure, 400-600 lb. Write for facts.

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—the pest killing mist so fine it seeps and soaks into every hiding place that breeds crop robbing disease. Kills germs, pests instantly. Sprays faster, needs less labor; thorough atomization, under high pressure, cuts solution bills. 4 sizes—100 to 300 gal. tanks; 1 to 3 gun capacities. Underslung, cut-under trucks make hill-side work safe. Wide tires ride over sand and mud. Short turn makes close work easy. 50 models from hand to largest power outfits. 50 years pump building experience back of every one. Before you buy any sprayer, write for HAYES free literature.

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800 ROOMS

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**\$2.50 A DAY FOR ONE PERSON**  
**\$3.50 A DAY AND UP FOR TWO**

Special Rates for Permanent Guests

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**Reasonable Prices**

Club Breakfast, 30c to 50c  
Luncheon, 75c  
Table d'Hôte Dinner, \$1.00

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Manager

Fruit Growers who market the most  
**"EXTRA FANCY"**  
 are the Growers who  
**PLAN AHEAD**



While You Are Spraying Now for Scale, Mite and Aphid Control, Plan to Meet the Later Inroads of Mr. Codling Moth



"Time to begin thinking of my lead"



Also in 1 lb Cans for Shrubs and Gardens



**T**his destructive larva is the apple and pear growers' greatest enemy. Get your supply of Grasselli Arsenate of Lead and Casein Spreader now and be prepared to apply these important codling moth sprays at the correct time.

Grasselli Spray Materials are certified as to quality and uniformity and are preferred by many of the leading growers. For prompt service, there's a Grasselli dealer near you—if not, write us.

**THE GRASSELLI CHEMICAL COMPANY**

Incorporated

Founded 1839 CLEVELAND, OHIO

GRASSELLI GRADE  
 Arsenate of Lead—Lime Sulphur—Casein Spreader  
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 A Standard Held High for 91 Years

**SPRAY** with the **OSPRAYMO**  
**High Pressure Machines**

Form a fine mist which stays on the foliage and makes the job effective. Using an OSPRAYMO means high pressure always.

OSPRAYMO sprayers have the last word in mechanical agitators, with two stiff adjustable brushes working automatically in cleaning the suction strainers. No clogged pipes or nozzles. Our slogan: *A Sprayer for Every Need—High Pressure Guaranteed*

Write for catalog. Don't buy till it comes.

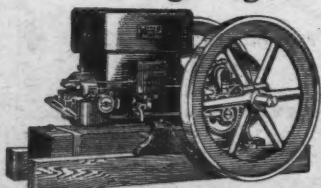
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 Kansas City, Mo., U. S. A.



CLIP THIS ADVERTISEMENT AND PLACE IN TOOL BOX ON YOUR BEAN SPRAYER

## FRUIT CROP PROSPECTS

(From Page Six)

which will be a factor in next year's yield.

### LOUISIANA

Citrus shipments amounted to about 265 carloads last season, and are likely to increase in future years. The citrus industry is expanding in *Plaquemines Parish* south of New Orleans, on both sides of the river. Large groves have been put out and the industry will undoubtedly expand, under the system of co-operative marketing now in vogue in that section. Prices for oranges have been very satisfactory during the last shipping season and future prospects are bright.

The winter of 1929-30 was severe and did much damage to citrus fruit trees, mostly satsuma orange trees in the territory north of *Lake Pontchartrain* and in *Beauregard Parish*. In the latter Parish, the trees were killed back almost to the ground in many places. If these frozen trees were cut back and attended to properly, they would probably sprout out again and in two- or three years recover their lost ground. The citrus trees south of New Orleans were not injured by the winter cold to amount to anything.

### TEXAS

Reports indicate early and late peaches fairly good bloom in northeast Texas. Possibly 10 per cent buds winter killed during severe January freeze. Time of blooming is normal to later. Losses from winter killing are heavier in early blooming peach section of east Texas. Weather conditions in *Rio Grande Valley* were ideal following severe freezing temperature in January and have helped to minimize damage to citrus fruits. Blooming period will be extended from one to two weeks this season and the set will be much lighter than usual. Damage to fig trees in *Coastal Belt* is unusually heavy following severe January temperatures, however, favorable conditions since that date may help conditions somewhat.

### IDAHO

Apple, prune, cherry prospects normal crop, but peaches, apricots near failure on account of low January temperature.

### COLORADO

Colorado early season peach prospects are good and greatly above average for this time of year. Weather has been mild with practically little freezing weather for six weeks and during this period there has apparently been little winter killing.

During January, low temperatures caused some losses in the North Fork district around *Paoia* and *Hotchkiss*. It is too early to definitely determine the damage already done, but estimates indicate 75 per cent of a crop is still possible in that district.

The *Redlands* district southwest of Grand Junction also suffered from winter freezes. This is a rather small district and has never entered heavily into commercial production. It lies lower than *Palisades* and its orchards are more subject to freeze damage.

The *Palisades* district is the main peach producing district. This is a small compact area around *Palisade* and includes a newer district south of *Palisade* called *Orchard Mesa*. *Orchard Mesa* entered into production for the first season last year when about 200 cars were shipped. This year should show heavier production. There has been no damage in the *Palisades* district from freezes to date and the prospects are now for a larger crop than 1929. The crop is dependent upon weather conditions during the spring months and usually is not considered safe from frost until after April 25. The *Palisade* district, however, has a natural protection from extremes in temperature and there is less danger from winter or spring freezes than in either the *Redlands* or *North Fork* districts.

It is too early to tell much about apples, pears and cherries. As nearly as can be determined at this early date these crops were not damaged by the extremely low temperatures in January.

### NEW MEXICO

Some blossoms of almonds, apricots and early blooming peaches killed, but probably enough buds set for crop if no more

frost occurs. Apples, pears and most plums safe to date.

### UTAH

Unusually low temperatures late in January destroyed a large percentage of the peach buds in some of the main commercial sections of Utah. At *Brigham City* the official record showed 23 degrees below zero on January 22, which is low enough to kill all peach buds except those in the more sheltered places. The crop of 1925 in that section was completely killed by a temperature, on December 25, 1924, of 24 degrees below zero. It is too early to determine just how bad this present damage is, but it is highly probable that most of the crop in the northern part of Utah's main peach belt is killed. In the southern part of this belt, temperatures were dangerously low, falling to 20 degrees below zero on January 21; so it is probable that a considerable portion of the buds were killed there.

No definite estimate of the amount of damage is practicable at this time. There are sheltered places, even in damaged orchards, which will contribute some fruit. Even in the worst season on record, that of 1925, there were 100,000 bushels of peaches produced in Utah, more than half of which came from areas which were regarded as absolutely ruined by the freeze of December, 1924. Damage from frost and freezing is always "spotted," so that a more thorough survey than is possible before blooming time is necessary to determine even approximately the amount of damage done, or to make a forecast of the probable production.

In the early peach section, the extreme southwestern part of the State, no serious damage is yet reported. The temperatures here did not reach as low as zero.

Sweet cherries suffered greatly from the cold winter.

The month of May is a critical one for peaches, cherries, apples and other orchard fruits in Utah, for in that month there is always danger of frost damage even as late as the end of May, and occasionally in the early days of June. A May and June free from frost damage would add materially to the prospects for Utah's orchard fruit.

Thus far no damage has been reported for apples. Utah's apple orchards bore small crops in the past year, and this fact tends to make the 1930 crop larger than it otherwise would be. But the important factors affecting the production are the amount of frost damage in May and June and the size of the "June drop." July 1 is about as early as practicable to make a forecast of Utah's apple crop.

### WASHINGTON

Peach crop will be light in some parts of the *Yakima Valley* according to reports from horticulturists there. Frost has killed a large part of the buds in *Benton county*. In *Vernita* district near *White Bluffs* certain varieties such as *Salway* give promise of a crop, but main crop varieties have been killed. In *North Central* Washington district some damage to peaches in lower places, but in some other sections where peaches are the major crop, there appears to be very small damage. In *Benton county* apricots are nearly as badly damaged as peaches. Orchards vary considerably as do different trees in same orchard. Cherries, apples, pears generally throughout *Benton county* not injured. Pears looking good in valley and plums and cherries also fared well during winter, extreme cold notwithstanding. Very little damage done apples or soft fruits anywhere in *Wenatchee-Okanogan county* by intense cold last winter. Apple prospects on whole most encouraging with every indication pointing to greater production than last season. Good sets of buds have been noted on virtually every variety of apple.

**MORE** than one million dollars' worth of miscellaneous farm products have been sold direct from producers to consumers by the curb market method since the first curb market in Alabama was established six years ago at *Gadsden*, says Miss Helen Johnston of the Alabama Polytechnic Institute. There are now 21 curb markets in the State. Sales last year aggregated \$406,310.11.



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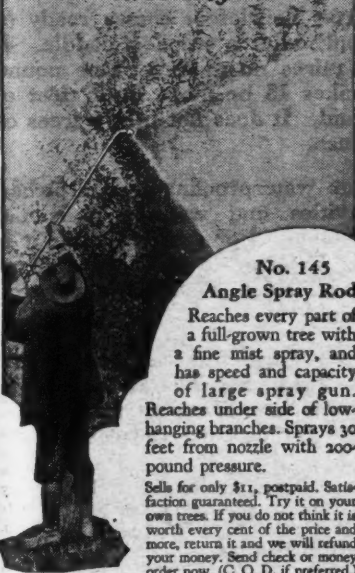
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### No. 145

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Reaches under side of low-hanging branches. Sprays 30 feet from nozzle with 200-pound pressure.

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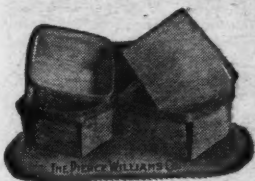
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## Cloudy Weather Limits the Set of Cherries

CHERRIES produce a light crop in seasons when cold, wet, cloudy weather is unusually prevalent during blossoming time. That this low yield of cherries is not due to lack of pollination has now been demonstrated by Dorothy Bradbury and R. H. Roberts of the Department of Horticulture at the University of Wisconsin, who have shown that an important factor is a matter of insufficient light. Shading young productive trees during the blossoming period but permitting free access to insects resulted in demonstrated pollination of the blossoms, but only 0.92 per cent of the blossoms set fruit as compared with 18.72 per cent for adjacent unshaded trees. Only three-quarters of a quart of ripe fruit was produced on the shaded trees as compared with 13 quarts on the check trees. The artificial "dull weather" prevented a crop from being produced. It is common observation that "open" trees set more fruit than dense-topped ones.

An intensive study of early Richmond trees was made during the past two years, and it was found that the set fruit was closely correlated with the amount of annual growth made by the terminal branches. Both old and young trees become non-productive when the annual terminal growth is short for three to five consecutive seasons, for under these conditions fruit spurs are not developed adequately.

## Many Leaves Make Big Apples and Pears

DR. J. R. MAGNESS of the United States Department of Agriculture reported at the Pacific Pear Growers' Conference held at Medford, Ore., the extremely-interesting results of an experiment made while with the Washington State College, showing that under normal conditions the number of leaves per fruit is the most important factor determining the size and quality of apples and pears. The striking effect upon the size of Bartlett pears was shown by the fact that when an average of only 10 leaves for each pear were left on a tree, the fruit averaged 229 to a box. With 20 leaves per fruit the average was 157 per box, with 30 leaves 128, and with 50 leaves 101 per box. About 60 leaves per fruit were found necessary to produce the best size of Anjou.

Since plenty of leaves are of such prime importance in manufacturing fruit of the best size and quality, Doctor Magness pointed out the necessity of promoting in the spring the growth of wood, upon which the spurs are so directly dependent. He also called attention to the fact that since pruning reduces leaves, it can easily be overdone. The most efficient manufacture of fruit by the leaves is dependent upon a plentiful supply of water, as stomata close when deprived of moisture, preventing the leaf from doing its work. Another practical application of the results of Dr. Magness' experiments is in thinning fruit so as to have a sufficient number of leaves per fruit to develop the desired size and quality.—S. W. Shear, University of California.

## Byrd Brothers Buy More Apple Acreage

FORMER Gov. Harry F. Byrd of Virginia and brother, Tom, of Winchester, Va., have purchased approximately 420 acres of bearing apple orchard near Romney, W. Va., it was revealed recently. The prices paid were not made public.

The plants purchased include the Hudekoper orchard and the plant of the Fairview Orchard Company. Recent surveys showed Governor Byrd the largest individual owner of apple orchards in the United States, aside from the holdings of his brothers and not including the recent purchases. The Hampshire county properties are in the midst of heavy producing apple area.—Homer Dye.

Uncle Sam fired a West Point cadet for getting married. Apparently the military authorities do not believe that a cadet should take up matrimony until he has learned how to fight.—Chicago Daily News.

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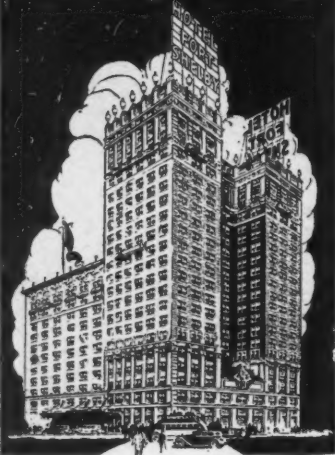
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DETROIT

## Preserving Georgia Fruits by Freezing

IN VIEW of wide interest created in Georgia concerning the possibilities of preserving fruit by freezing and inquiries being made as to the results of tests carried on at the Georgia Experiment Station for several years, a statement is issued by the station that indicates commercial possibilities, with some phases still in the experimental stage, such as the kind and quantity of sugar to use and the most suitable temperature to maintain.

Six Georgia fruits have been included in the experiments—peaches, pears, muscadine grapes, blackberries, raspberries and figs. These are kept in the freezing room in our laboratory at a temperature of from five to 10 degrees Fahrenheit for about six months before examination. The fruits are stored in three types of containers, glass, tin and pasteboard cartons. Some of the lots are stored without adding water to the small amount of fruit juice in the container; to others water is added; to still others water is used with varying amounts of sucrose sugar.

The method of preservation that gave best results is as follows: The fruit is harvested when fully ripe, prepared as if to be eaten immediately, and placed in pasteboard cartons of any desired size, glass containers not proving suitable because they are likely to break due to the extreme temperatures. The fruits, or pieces of fruit, are covered with a syrup

made by dissolving six to eight pounds of sugar in each gallon of water. The cartons are then closed and placed in the freezing room, where they remain until they are wanted for consumption. While in the freezing room, the contents of the cartons freeze solid and are removed by holding the carton in a stream of running water, which melts the cake of frozen fruit sufficiently to be removed.

There is apparently no limit to the length of time that fruits may be preserved in ice. The chemical and physical properties of fruits preserved in this manner are probably nearer like those of the original fruit than by any other method ever developed by horticultural science. The color, flavor and aroma are preserved as nearly perfect as the means at hand can detect. The flavor of fruits frozen in water alone is not as well preserved as in fruits frozen in the sugar solution.

Such data as have been obtained at the Georgia Experiment Station indicate great commercial possibilities, but the kind of sugar (sucrose, dextrose or levulose) and the percentage of the sugar to weight of fruit, or other liquid used in the containers with the fruit have not been definitely determined. The most suitable temperature and the most practical way for obtaining it is also in the experimental stage, but this problem relates to electrical and chemical engineering as well as to horticulture.—J. G. Woodroof, Georgia.

## Advantages From Federal Loans

(From Page 13)

they had been able to enjoy during the past preceding century.

### Diversified Farming

THE semi-annual payment plan, as used in a majority of the banks, has encouraged diversified farming, in that the borrower realizing that his payments become due at two different periods of the year has in many instances divided his production in order that he may have available funds at the proper time with which to meet his payments. This has had a tendency in many instances to discourage one-crop farming, thereby benefiting the community as well as the individual. It has encouraged crop rotation and soil improvement, as well as stock raising, dairying and poultry production, on an economic and scientific basis. It has more forcibly brought to the attention of the farmer the fact that his industry requires mental as well as physical activity and that farming is a business to be skillfully managed for best results just the same as other industries.

### Perfection of Land Titles

THE Federal Farm Loan System has done much toward the perfection of land titles, in that it has been more forcibly brought to the attention of the owner of the land that he has something of value that should be more carefully guarded than has been the general practice. The careless method heretofore employed by many in making real estate conveyances is being abandoned and the vendor as well as the vendee is becoming more careful in the manner of making as well as the condition of acceptance of real estate titles. This eliminates the cause for and necessity of much litigation and the bringing of loss and disappointment to many innocent individuals. This item has probably not been given as prominent a place of importance among the benefits derived from the system as it may be entitled to, due to the fact that it is only the individual who has experienced the loss of his home through a defective title who can fully appreciate the importance of a well grounded title.

## The Market Review

(From Page 14)

ries that seem to be filling a long-felt want in the fruit markets. Strawberries have been going out of Plant City in steadily increasing volume since the beginning of the year, the extra-early ripeners getting to market for Thanksgiving Day, and then for Christmas and New Year's feasts. But since January first the movement has been large, and with exceptionally fine weather the growers found it hard to keep up with the crop. Some time ago all previous records were broken for shipments, and again new quantity figures were marked up. A few days ago the growers found that more than a million dollars have been paid for strawberries at the Plant City loading station this season. The season movement, up to February 25, has somewhat passed the three-million-quart mark, and the berries are going strong and selling at a good price. It has previously been the case that, when the picking reached or neared the peak in berries, the prices would go down to the point where there was little profit to the shippers. This year, with the quotations last Monday ranging from 25c to 29c a quart, there was no question about the desirability of going right ahead with the crop. Report from Plant City on Monday's movement showed eighteen solid cars of strawberries going out, and to this was added 308 'pony refrigerators.' The total shipment on that day was stated as about 200,000 quarts. The value to the shippers was estimated at \$59,000, and here it was indicated that

the amount received this season had passed the million-dollar mark. And the good work goes right on."

Reports to the Department of Agriculture on a carlot basis indicate a total movement of 1160 cars of berries from Florida by March 10, or nearly the same as the year before. The early movement was much more active than that of last season, but lately the shipments have fallen below last year's corresponding figures. Growers were getting about 30c a quart or 15c a pint. City prices were very moderate.

Frosts caused some damage in producing districts of Louisiana, but the total output for the season may not be greatly reduced. Shipments were expected to be slightly delayed, but will be under way by the opening of April.

The results of investigations covering the packing and handling of strawberries by the frozen-pack method in the Pacific Northwest have been published by the United States Department of Agriculture in Technical Bulletin 148-T, entitled "The Frozen-Pack Method of Preserving Berries in the Pacific Northwest." Approximately 100,000 barrels of 50-gallon capacity were packed in 1928.

Personally we don't know the secret of success, but sometimes we are afraid it's work.—Dallas News.

Serving tart fruits for breakfast stimulates the appetite.



## Protects Orchards, Vineyards, and Shade Trees

When you band trees or vineyards with Tree Tanglefoot, you positively protect them from climbing insect pests that destroy foliage and buds. Why wait until these insects commence their destructive work? Band now!

One banding remains effective three to four months—outlasting 10 to 20 times anything else. Nothing else on the market so quickly and effectually controls the creeping type of insect pest. The wingless female canker worm can not lay her eggs where the larvae will devour the foliage. Neither can climbing cut worms destroy the buds.

Tree Tanglefoot comes ready to apply with a wooden paddle. It requires no mixing. One pound makes 15 or more lineal feet of band. It does not injure trees or vines.

For waterproofing tree crotches, cavities and wounds it is unequalled. For grafting work it is far superior to ordinary grafting wax. Keep a supply always on hand.

Tree Tanglefoot can be obtained at Seed, Hardware, and Drug Stores in convenient sized packages for orchard and garden use.

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With new Unit Tool Control even a novice easily does closest work.

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## QUESTIONS and COMMENT

(From Page Eight)

Superfine sulphur may be obtained from any of our large and standard spraying chemical companies and the cost will range around \$2.50 for a 100-pound bag. In ton lots perhaps a price of \$2.25 per hundred weight may be secured.

For more specific information relative to dusting orchards under Michigan conditions, it is suggested that you request information from your own Agricultural Experiment Station, East Lansing, Michigan.

### Fungous Diseases Responsible for Rotting of Fruit

The fruit of one of my Astrachan apple trees rots. Can you tell me what to do?—J. W. V., Maine.

IN ALL probability the fruit of your Astrachan apple tree is affected by fungous diseases which cause it to drop. Careful and timely spraying, using lime-sulphur solution at the rate of one to one and one-fourth gallons and one pound of arsenate of lead in 50 gallons of water should prove satisfactory as a spray. It is also possible that dry lime-sulphur may be used profitably at the rate of four to five pounds to 50 gallons of water with one pound arsenate of lead.

The applications should be made just before the trees bloom, immediately following the dropping of the blossoms and at least two more applications at intervals of about two weeks apart.

For more detailed and specific information for your conditions as regards to spraying apple trees, it is suggested that you write to your own agricultural experiment station, Department of Horticulture, Orono, Maine.

### The Shot-Hole Borer

I am sending you a sample of my peach tree. Can you tell me what is troubling this tree and what to do for it?—A. J. M., Ohio.

THE PEACH tree twig which you sent for our examination shows injury by the so-called shot-hole borer. This little beetle usually infests peach trees which show low vitality or a lack of vigor. It is, therefore, very important that the trees be stimulated into a more vigorous growth by good cultivation and fertilization. Spraying may also be necessary to keep the leaves in good condition.

Moreover, it is also important that all infested twigs and dead limbs be cut out and burned; in fact, if the trees are pruned moderately, cutting back rangy branches into one and two-year-old wood to give the trees the proper shape and to equalize the spread of branches and admit sunlight to the center of the tree, such pruning will be found of value in helping to produce a stronger growth and at the same time stimulating the production of fruiting wood closer in toward the trunk.

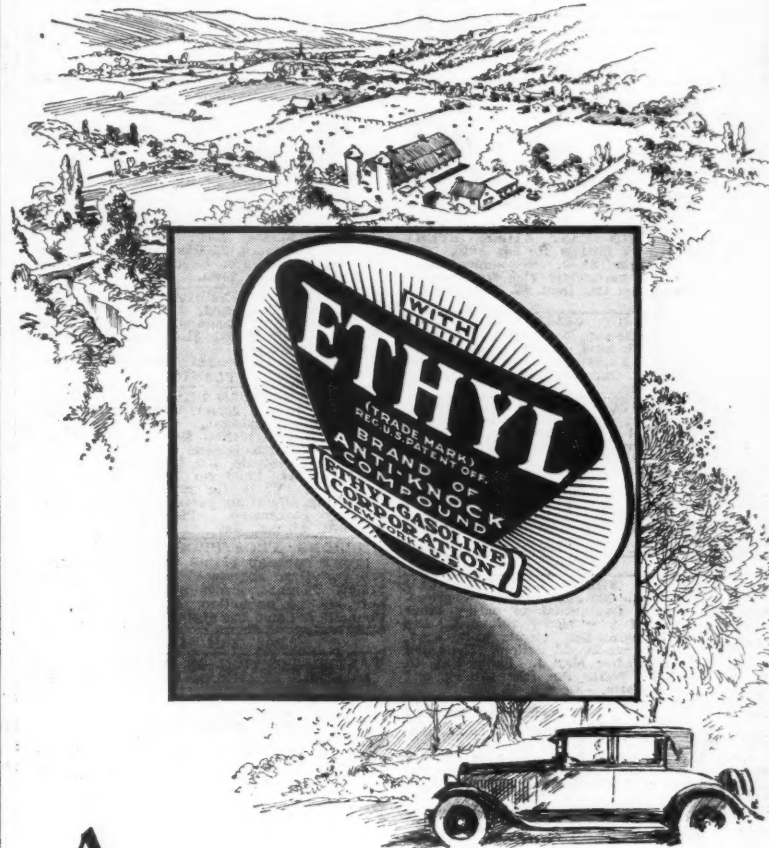
### Bordeaux for Grapes

Will you kindly supply me with the formula for making Bordeaux mixture as used for the control of brown rot of grapes. Also the proper time of applications.—S. B., Illinois.

THE FOLLOWING formula and method of preparing Bordeaux mixture for spraying grapes is suggested:

Investigations have shown that in making Bordeaux the use of six pounds of copper sulphate to 100 gallons of water is ample for the control of black rot of grapes. The use of more copper sulphate will not make up for lack of thoroughness of application. The formula now recommended is the 6-6-100; that is, six pounds of copper sulphate (bluestone or blue vitriol), six pounds of stone lime or eight pounds of hydrated lime, and 100 gallons of water. The use of more lime is not necessary in making Bordeaux for grapes; in fact, it is objectionable, as it increases the amount of residue on the berries. To prepare 6-6-100 Bordeaux, dissolve six pounds of copper sulphate in five or six gallons of water. Pour this solution into the sprayer and add enough water to make about 90 gallons. Next slake six pounds of stone lime, using just enough water to keep the lime from becoming dry. When through slaking, thin with a little water and strain through a 20-mesh screen. While agitating the copper sulphate solution, pour in the lime mixture,

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Use Ethyl Gasoline and get the most out of it. With Ethyl, you run in second less, which saves fuel. There is less wear and tear, less engine strain, which slows up depreciation and reduces repair bills. There's less frequent lay-up for carbon removal, which saves time and money.

And in those small, old cars ("mud cars"), used for rough going, Ethyl makes just as much difference as it does in new, more expensive cars.

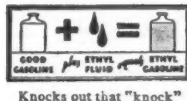
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**AMAZING PROFITS SELLING NEW TABLE cloth.** Looks like linen. Wash like oilcloth. Samples free. Bestever Co., 113 Irving Park Station, Chicago.

**BIG MONEY AND FAST SALES, EVERY owner** buys gold initials for his auto. You charge \$1.50; make \$1.35. Ten orders daily easy. Write for particulars and free sample. American Monogram Co., Dept. 92, East Orange, N. J.

**BIG MONEY DAILY, SELLING SHIRTS OF all kinds.** Neckwear, underwear, socks, pajamas, sweaters, raincoats, coveralls, pants, children's play suits. Experience unnecessary. Out-let free. Nimrod Co., Dept. 102, 492-28 Lincoln Ave., Chicago.

**I OFFER YOU GROCERIES AT WHOLESALE and a wonderful opportunity to make \$15 a day as my local representative.** New Ford Sedan free to producers. Immediate profits. Albert Mills, 5032 Monmouth, Cincinnati, O.

## BEES

**PACKAGE BEES WITH YOUNG ITALIAN queens.** 2 lbs., \$3.25; 3 lbs., \$4.00. Large orders discounted. Satisfaction guaranteed. Overhey Apiaries, Leonville, La.

## CHICKS

**BABY CHICKS Sired by Pedigreed males,** records to 320 eggs. New low prices. Quick shipment. Guaranteed to outlay other chicks or part of your money refunded. Big type. White Leghorns that lay big white eggs. Hatching eggs, 8 weeks old pullets. Hens and males half price after May 1. Shipped C. O. D. on approval. Write for free catalog and special price bulletin. George B. Ferris, 922 Union, Grand Rapids, Mich.

## FARMS AND ORCHARDS

**ORCHARD, 8000 APPLE TREES, 160 ACRES.** Some timber. Good buildings with modern conveniences. Close to town of Bedford, Pa. Adjoins lands of Bedford Springs Hotel. Send for illustrated folder. Box 553, Windber, Pa.

## FARMS WANTED

**WANTED—HEAR FROM OWNER HAVING good farm for sale.** Cash price, particulars. John J. Black, Chippewa Falls, Wis.

**WANTED—TO HEAR FROM OWNER OF land for sale.** O. Hawley, Baldwin, Wis.

**WANTED—FARMS OR BUSINESS ANY where.** Cash buyers. National Brokers, 2615 Lakewood, Detroit, Mich.

## LIVE STOCK

**FOR GUERNSEY OR HOLSTEIN CALVES from heavy rich milkers,** write Edgewood Dairy Farms, Whitewater, Wis.

## HELP WANTED—INSTRUCTION

**WANTED IMMEDIATELY, MEN-WOMEN, 18-35,** qualify for steady government positions; \$101-\$250 month; common education; no government experience required; vacations with pay; many needed soon. Write. Instruction Bureau, 259, St. Louis, Mo., quickly.

**RAILWAY POSTAL CLERKS, \$158.00-\$225.00 month.** Steady. Spring examinations likely. Common education sufficient. Men, 18-35. Particulars free. Write immediately. Franklin Institute, Dept. J-69, Rochester, N. Y.

## NURSERY STOCK

**100 GENUINE MASTODON EVERBEARING, \$1.50; 1000, \$12.95.** Catalog free. Edw. Lubke, New Buffalo, Mich.

then add enough water to make up to 100 gallons.

When more than one tank of Bordeaux mixture will be needed, it is more convenient to prepare stock solutions of copper sulphate and of lime. Stock solutions of copper sulphate are made by dissolving the copper in water at the rate of one pound of the copper sulphate to one gallon of water. If suspended in a bag near the top of the water, the copper sulphate will dissolve in a few hours. Wooden or stoneware vessels should be used for holding or handling copper-sulphate solutions. A 50-gallon barrel is generally used. Fifty pounds of copper sulphate is weighed out in a burlap bag which is tied so as to hang close to the top of the barrel containing 50 gallons of water. After it has dissolved, the solution should be thoroughly stirred. Stock solutions of lime are made by weighing out a definite amount of stone lime and slaking with a small quantity of water and after slaking adding enough water to make as many gallons of mixture as there are pounds of lime. This gives a stock solution of copper sulphate with one pound of copper sulphate to one gallon, and a stock solution of lime with one pound of stone lime to one gallon.

To make 100 gallons of a 6-6-100 Bordeaux mixture from the stock solutions, fill the sprayer about two-thirds full of

**STRAWBERRY PLANTS—THE GREAT MASTODON;** have berries eight months in the year. 100, \$2.00 postpaid. Beautiful catalog in colors free. Full line. J. A. Bauer, Judsonia, Ark.

**100 GUARANTEED MASTODON STRAWBERRY plants,** \$1.50 to 4th sons. V. C. Razor, Flemingsburg, Ky.

**100 DUNLAP STRAWBERRY PLANTS, 75c.** 100 Mastodon Everbearing, \$1.35, postpaid; Mastodon, \$12.00, 1000; Dunlap, \$2.75, 40 Gladoli, 15 Grapes, 25 Raspberries, 100 Asparagus, or 18 Rhubarb, \$1.00. Catalog. Kiger's Nursery, Danville, Iowa.

**100 MASTODON EVERBEARING STRAWBERRIES,** \$1.40; thousand, \$11.00. 100 Premier strawberries, 85c; thousand, \$8.50. 12 assorted Dahlias or 15 Phlox, \$1.00. Myers Nursery, Arcadia, Wisconsin.

## PLANTS

**EARLY VEGETABLE PLANTS—FROSTPROOF** cabbage plants; Jersey Wakefield, Charleston Wakefield, Copenhagen, Golden Acre, Flat Dutch. Tomato plants: Earliana, Bonny Best, Baltimore. Onion, lettuce, potato plants. Prices as follows: Postpaid, 100, 50c; 500, \$1.50; 1000, \$2.75; Collect, \$2.00 per 1000. Special prices large lots. Write for prices on pepper and egg plants. Carefully packed. Varieties labeled. Delivery guaranteed. Piedmont Plant Co., Box 629, Albany, Ga.

**MILLIONS FROSTPROOF OPEN FIELD** grown cabbage plants ready. Best standard varieties. Expresses \$1.75, 1,000; 10,000, \$15.00. Tomato, sweet potato plants. Pennut, shelled, unshelled. Prices mailed. J. T. Council & Sons, Franklin, Va.

## POSITION WANTED

**WANTED—POSITION AS ORCHARD SUPERINTENDENT.** Eighteen years' experience. References. Harry McKinney, 422 N. 5th St., Quincy, Ill.

## SONG POEM WRITERS

**SONG POEM WRITERS—"REAL" PROPOSITION.** Hibbeler, D-96, 2104 Keystone, Chicago.

## FRUIT GROWERS' SUPPLIES

## PRUNING, GRAFTING

## BUDDING EQUIPMENT

**M. & G. Knives, Tiffany Pruners, Disston Saws, Hand Shears, Jones Patch Budders, Budding Tape, Tree Scrapers, Merrilbrook and Clark wax melters, Tree Seal for tree wounds, Tree Scrapers, Berry Hooks.** Best quality hand and brush waxes, Parapin Wax.

## COD-O-CIDE TREE BANDS KILL

## CODLING MOTH LARVAE

Chemically treated, quickly applied. No further attention. Kill worms while you sleep. Small cost per tree. Valuable supplement to careful spraying. Banding recommended by Federal Bureau Entomology. Booklet, with full information and prices.

## FRUIT GROWERS' EQUIPMENT AND SUPPLIES

Complete line, everything needed to prune, spray, fertilize, cultivate, harvest, pack and market. No general catalog, therefore state wants carefully when requesting lowest cash prices, advising quality and quantity desired. Your interests are ours.

## EDWIN C. TYSON,

Tyson Orchard Service, 345 Orchard Ave., Flora Dale, Penna., U.S.A.

arsenate of lead near harvest time, as the spray colors and mars the appearance of the fruit, causing it to be discriminated against upon the markets. Spraying with Bordeaux should, therefore, be discontinued at least five to seven weeks before harvest.

## Rooting Tame Grape Cuttings

Would like to know how to root the tame grape cuttings as I cannot buy them. One of my neighbors said he would give me all the cuttings I wanted, so will you please tell me the right way to root them.—L. K. H., Oklahoma.

**THE MAKING** and rooting of tame grape cuttings is a simple process. For best results, as a rule, cuttings should be made rather long, so that when planted the lower end will be in moist soil. A cutting of proper length will usually consist of three or more buds, or eyes, and be about 12 to 14 inches long.

In making grape cuttings, cut close to the lower bud (within one-half inch) to insure good root development. Count this bud one and then count off two more buds above, and if the cutting is 12 to 14 inches long, cut about an inch to an inch and a half above the top bud, or eye. The cutting is then complete. Proceed to make other cuttings in a similar way until enough cuttings are made for the planting.

The cuttings are usually tied in bunches of 25 or 50 and stored in damp sawdust, sand, or shavings and placed in a cool place, like a cellar, until arrangements have been made for transplanting in the field or nursery row. The cuttings may be made any time during the fall or winter after the leaves drop and up until growth starts in the spring. It is generally advisable to select the wood and make the cuttings in December or January to avoid the use of winter-injured canes. Where this has not been done, however, by being careful, one may select the canes in the spring at the time growth starts, make the cuttings and procure good results.

As soon as the soil will do to work in the spring the cuttings may be "lined out." A deep furrow is made in well prepared soil, and the cuttings set against the steep side of the furrow six to eight inches apart in rows about three and one-half to four feet apart. The soil is then tamped around the base of the cuttings, holding them upright. More soil is plowed in or raked in with the hoe until the ground is level and the top bud of the cutting protrudes above the surface of the soil.

It is important that good cultivation be given throughout the spring and summer in order to induce a strong vigorous growth of the cuttings. In extremely dry weather during July and August, it may be advisable to irrigate where water is available.

## Three Oriental Peach Worm Projects

(From Page Ten)

eradication of the Mediterranean fruit fly, only thousands have been asked for to deal with the peach moth, but if the large scale experimental work indicates that the method is fully effective, it will be expected of the National Horticultural Council that they will carry the request for a greater appropriation to expand the work so that a campaign for eradication may be started next year.

The loss of the peach crop in the Middle West offers no reasonable excuse for a cessation of intense activity in combating the peach moth. It will be in the orchards whether there be fruit or not, and in all probability the lack of peach fruit will drive them into the apple orchards. The problem has apparently resolved itself into another menace for the apple grower and he might well combine with the peach grower in an effort to destroy this new pest before it becomes as formidable as the codling moth.

**GENERAL** improvement in the methods of marketing West Virginia apples, potatoes, peaches and other crops is attributed to increased use of Federal-State produce inspection service, by the West Virginia Department of Agriculture. The department reports that 2912 cars of fruits and vegetables were inspected last year, compared with 2150 cars in 1928, 2456 cars in 1927, and approximately 300 cars in 1924.

## EFFECTIVE SPRAYING

Made Easier by using the Todd Perfection HOSE SWIVEL

Postpaid \$3.00

New labor, time and temper-saving device for use between hose-coupling and spray gun. Allows free motion of gun in any direction. Hose cannot kink! Universal ball joint will not leak under highest pressure. Very compact, light in weight. Users say lessened muscular effort pays for swivel in day's use. For free circular mention dealer's name. Fruit growers' supply dealers write for proposition.

A. B. TODD & CO.

Dept. FG VERMILION, OHIO

## Index to Advertisements

The concerns whose advertisements appear listed below are equipped to give prompt and satisfactory service to the American fruit grower. Most of them issue literature that is freely at the disposal of our subscribers. It is to the advantage of all that when writing to an advertiser you use the address exactly as it appears in the advertisement, and that you state in your letter: "I read Your Advertisement in AMERICAN FRUIT GROWER MAGAZINE."

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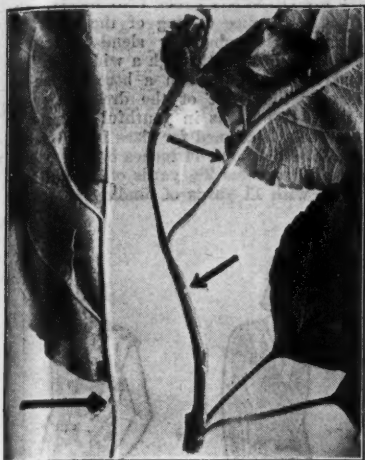
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## Is the Pear Tree Responsible for Blight on Apples?

(From Page Five)

the tissues, within the wood, clearly suggests that control measures based on surface disinfection of cankers, or of excision of outer bark, is not likely to be effective in controlling this disease, and that such measures may only be expected to arrest the disease in very young infections.

It cannot be claimed that these recent



The fire blight germ oozing out of infected apple tissues. Note the droplet of ooze on the leaf stalk at the left, one on the stem near the middle, and on the leaf stalk at the upper right. This ooze or exudate has been excluded from the diseased tissues and consists of countless thousands of microbes.

discoveries are going to bring back the pear industry into America, but with a clearer understanding of the fundamental factors involved in this disease, we are in a better position to control the blight on apples and to face the pear blight problem more adequately.

## The Pollination of Tree Fruits

(From Page Seven)

10 to 20 days before flowering, may increase the set most remarkably. While young trees usually do not suffer from lack of nitrogen, those in full bearing may be highly benefited by this treatment. In fact, many cases are known where abnormally small crops of fruit were not due to improper pollination, but to a general weakness of the trees—usually a shortage of nitrogen. In all such instances manuring with a nitrogenous fertilizer will produce a quick relief.

When pruning has been neglected, trees often bloom heavily but set little fruit. A thorough thinning out of the most crowded parts of such trees will revitalize the remaining branches. This leads to better vegetative growth, formation of new spurs, fewer but more vigorous fruit buds, and larger leaves. As a consequence, there will be a marked increase in fruit production; and, what is more important, the fruit will be of larger size and of better color.

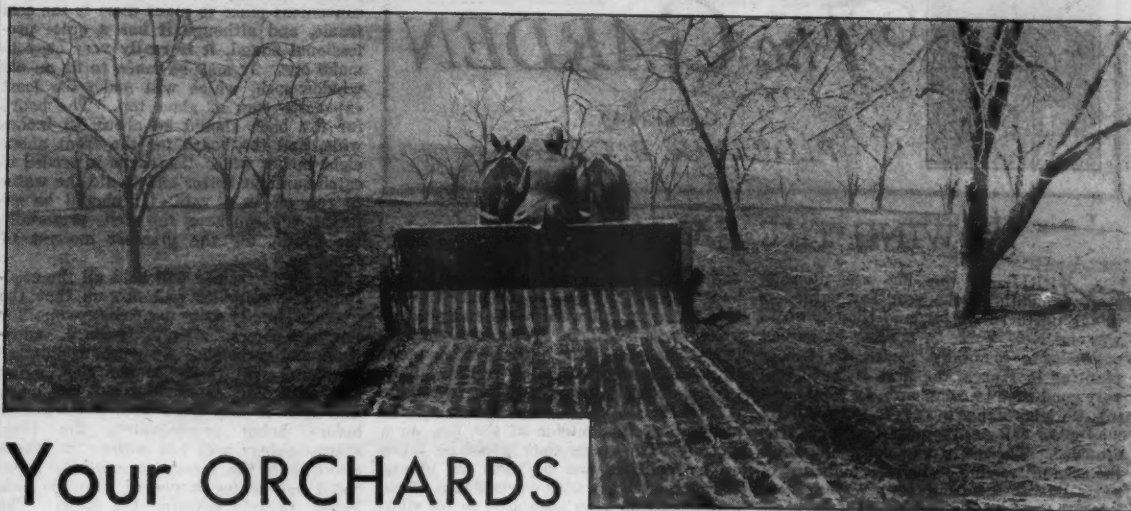
### Determining the Cause of Unfruitfulness

THE general procedure in an orchard that blooms heavily but does not set fruit would be as follows: First see to it that spraying, pruning, and other orchard practices are executed properly. Then apply a readily available nitrogenous fertilizer about two weeks before the flowers open. If the trees still refuse to bear, then it is quite evident that a pollination trouble exists. When bees or other insects are not present in large enough numbers at the time of blossoming, a few hives should be obtained for this purpose. If no relief is secured then, it is rather certain that a real pollination trouble exists and proper pollinizers should be provided in order to assure a maximum yield of fruit.

### Falling Hair

"My hair is falling out. Can you recommend something to keep it in?" "Certainly," replied the drug store clerk. "Here's a nice cardboard box."

# Just before BLOSSOM TIME



## Your ORCHARDS are hungry for NITROGEN

Swelling buds give the signal when nitrogen is needed. Plenty of *nitrogen* is as essential to fruit production as sunshine and rain.

Nitrogen is the fertilizer element that makes trees grow vigorously and bear high quality fruit—the strong, healthy fruit that brings top prices in the fancy market.

Successful orchardists have found from experience that it pays—and pays big—to top-dress their orchards *just before blossom time* with Arcadian Sulphate of Ammonia.

Arcadian is *rich in nitrogen* (20.56% guaranteed analysis). All soluble, all quickly us-

able by the trees. Arcadian is fine and dry—easy to put out—and one application lasts through any ordinary growing season.

To be sure of getting Arcadian, place your order early with your fertilizer dealer. Orchardists everywhere are invited to write The Barrett Company for information about nitrogen fertilizer. Address our nearest office.

The *Barrett* Company

40 Rector Street, New York, N. Y.

Atlanta, Ga.    Norfolk, Va.    San Francisco, Calif.  
Memphis, Tenn.    Cleveland, Ohio    Toronto, Ont., Canada

## ARCADIAN

Reg. U.S. Pat. Off.

### Sulphate of Ammonia

**NITROGEN** is the GROWTH ELEMENT As essential as sunshine to growing crops. Be sure your crops get plenty of nitrogen both in the complete fertilizer you use and as top-dressing.

## Let BEES Increase Your Income

EXPERIENCE has shown that colonies of bees properly distributed through the orchard at the right time will increase the "set" of fruit. Doubled, and even trebled yields are not uncommon, and this slight extra work is in itself a source of profit!

### INFORM Yourself about Extra Profit Possibilities

To assist our fruit growing readers in getting dependable information about the possibilities in beekeeping, the necessary steps and the cost to start with bees, we have arranged to make the offer contained in the square to the right.

"Beekeeping for the Fruit Grower" treats this important subject from the standpoint of the man whose chief concern is the size and quality of his fruit crop, rather than from the view of the commercial honey-producer. Yet it discloses sources of profit from the beekeeping investment itself.

You can renew or extend your subscription to "THE FRUIT GROWER" for one year, and receive "GLEANINGS" likewise for a year, together with the booklet.

The subject is important to every fruit grower, the information offered is entirely dependable, and the cost is slight—one dollar. Your name and address on the lines below should be sent today to

American Fruit Grower Magazine, 53 West Jackson Boulevard, Chicago, Ill.

GENTLEMEN: I enclose a dollar. Send AMERICAN FRUIT GROWER MAGAZINE and GLEANINGS IN BEE CULTURE both for one year, with the booklet "BEEKEEPING FOR THE FRUIT GROWER," postpaid.

Name.....

Address.....

(If you are now a subscriber to AMERICAN FRUIT GROWER MAGAZINE and you wish your subscription extended or renewed, please check here (.....))

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GLEANINGS IN BEE CULTURE Monthly, One Year. (New or Renewal)

AMERICAN FRUIT GROWER MAGAZINE, One Year. (New or Renewal)

BEEKEEPING FOR THE FRUIT GROWER, By Mail Postpaid.

All for \$1.00



GLEANINGS IN BEE CULTURE: An illustrated monthly magazine for those interested in bees and beekeeping, and well established as an authoritative journal. Departments: "Talks to Beginners," and Questions and Answers are of special value to the inexperienced man who desires to get the right start.

BEEKEEPING FOR THE FRUIT GROWER: A concise presentation of beekeeping as an aid to orchard profits. Some of the subjects covered are: Honeybees for the Orchard, Renting Bees, Buying Bees, Package Bees, Purchase of Colonies, Cost of Equipment, Problems of the Fruit Grower-Beekeeper, The Fruit Grower's Apiary, Bees and Fruit, etc., etc.



## In and About The GARDEN

Conducted by  
FLORENCE B. CRANE

### SOWING THE EARLY SEEDS

APRIL is the big seed-planting month of the year for gardeners in the northern States, and though we in western New York, in a fever of garden enthusiasm, generally begin the indoor planting in March, the first of April is a very good time to commence. In a late season, the plants that have been started early may grow tall and spindly or become too crowded. There are two sorts of out-of-the-ground sowing—indoor planting of seeds like tomato and pepper, that need warmth; and outdoor planting of the seeds of hardier vegetables like cabbage and celery, that would die in the artificial atmosphere of the house, and yet need protection during the cold nights.

The seeds that need warmth we sow in pans and boxes in the house. For tomato plants we use an old-fashioned, eight-quart milk pan with slanting sides. Fill it nearly full of good potting soil (mixed

and stored in the cellar last fall), and press it down firmly. If you bake the soil in a hot oven, all weed seeds and possible insects will be killed. Then from the center of the pan, with a sharp stick mark off, as if cutting a pie, as many sections as you expect to have varieties of tomato plants. Write each kind on a label and paste it on the outside of the pan on a section. The space that would be taken up by markers can be used for plants. Water thoroughly with warm water. Then, taking care to keep each seed in its allotted section, place them one inch apart, one seed in a place all over the pan. Sift on fine soil until every seed is covered. No more watering is necessary at the time of sowing, as the water will soak through and moisten the top soil. Cover with a glass, slightly ajar to admit air, and place on a warm soapstone to supply bottom heat. Change as often as the soapstone gets cold.

Pepper seeds are sowed in the same way, in a cigar box or a cedar flat, marked into sections crosswise to contain the different varieties. The water used to soak the soil before planting the pepper seeds should be fairly hot.

The seeds of Coleus, Snapdragons and Petunias are sowed in the same way, except that, as these seeds are very fine, the top soil must be as fine as you can make it. The tiny seed must get moisture and food from contact with the surrounding soil, and the finer the soil, the more points of contact it can have with the seed, and the more food the seed will get.

The hardier seeds, such as celery, cabbage, cauliflower, and asters, may be sowed outdoors in boxes in much the same way as the tomato plants, covered with glass, and protected at night; but a more convenient place to plant them is the cold frame, and although it has a quite professional sound, it is really very easy to make one. It may be made to fit an old window-sash, which will make the least expensive sort of glass top. The board for the back should be about 12 inches wide, and the board for the front about eight inches wide. The slope is needed to catch sunlight better and to aid the water to run off in a rain. It should be set facing the south or the east, preferably the south, for the greatest amount of sunshine.

Two cold frames will hold all the seedlings of vegetables and flowers that the average family can use. Keep one for flowers—asters, zinnias, cosmos, marigolds and verbenas. A surprising number of plants will thrive in the rich, moist soil, with daily exposure to sun and light, and even if they grow into a thick mat before being transplanted, the tiny, sturdy things will not suffer in transplanting if the roots are carefully separated and water is poured into the hole before entirely covering the plant. The cold frame needs a bit of daily attention if the plants are to survive; it must be covered with burlap or a piece of old carpet at night to protect against frost, and the glass must be raised and propped open with a stick during the day to keep the sun from blistering the tender plants through the glass.

Baby plants are like human babies in their need for loving care and attention. They will die if deprived of moisture for even a few hours, so do not let the soil around the seedlings become dry; neither must it be kept wet, for then the tiny plants will "damp off," that is, become brown near the soil and die. A draft is bad for them, too, yet they need fresh air and sunshine. A great deal of work, you say? Yes, of course, but we love the things we take care of, and there is great spiritual reward in watching the tiny things grow—the things we have tended and cherished, and material reward in later abundance of fresh vegetables and profusion of flowers in our gardens.

### A HOME FRUIT GARDEN

EVERYONE likes fruits of some sort, and even if you feel you would like to have a fruit garden but haven't time to make one, you can plan one, and then set out one tree each year, or two or three berry bushes, or a grapevine. You can get information about the fruits best suited to a particular locality by writing for leaflets and bulletins on fruit trees and berry bushes to the United States Department of Agriculture, Washington, D. C.

Choose thrifty trees, in early spring before the roots have started, preferably from a nearby nursery where the soil and climate are like your own. Two-year-old trees are best. "Heel" them in by digging a trench, laying the roots in, and covering with soil to keep the fine capillary roots from drying out. These fine roots feed the tree, and if they become too dry, they cease to function.

Choose high ground for the tree, spade a deep hole, wide enough for the roots to spread out well, and fill the bottom of the hole with fine soil. The fine roots make more contacts with the particles of fine soil than with coarse, and so can absorb more nourishment.

Prune the roots of the tree carefully. Cut off one-third of the longest roots, cutting from below upward and outward with a curved pruning knife, so that a large amount of exposed surface will come in contact with the soil. Cut off all broken roots, leaving them with a smooth surface, so there will be no lodging place for water.

Spread out the roots in a natural fan shape in the hole, cover with more of the fine soil and press down firmly. Pour in a few quarts of water slowly, and shovel in earth until the place where the tree is budded is covered. Tramp the soil down firmly and mulch with straw to hold the moisture. Prune the top back to the desired shape, judging the amount of top-pruning you have to do by the amount of root-pruning; if a great deal of the root had to come off, you need to take off

more of the top. It is a good idea to build a small box fence around the tree for its first season to protect it against accidents.

Dwarf fruit trees are good for small gardens; they are ornamental and bear sooner and more abundantly.

Strawberries are so delicious and have such a long season that everyone who has even a small garden ought to have a strawberry bed. April or perhaps May in the North is the best time of the year to start one.

Select a well-drained spot near the house, as strawberries do not do well in a sour or wet soil. Put on plenty of straw stable manure, and harrow it in early. If the bed was not plowed in the fall, the manure may be plowed under. If new land is chosen, it is a good idea to put in a cultivated crop one year before setting the strawberry plants to kill the grubs and wire worms.

Choose new plants formed the previous season to set out; you can tell them by their clean, white roots. The old plants have dark roots that have pushed the crowns above the ground. There are two kinds of plants, the perfect bloomers that fertilize themselves and bear alone, and the imperfect, or pistillate bloomers, that need a perfect bloomer nearby to fertilize them. About every third row ought to be perfect bloomers.

There are three ways of planting a strawberry bed: 1, in hedgerows, four feet apart with plants two feet apart, the runners being trained to go lengthwise of the row to a width of one foot; 2, in hills, where the runners are cut before they root, resulting in better fruit, more easily picked; 3, in matted beds, with plants in rows three feet apart, and plants 18 inches apart, allowing the plants to root and mat across. This is the usual way of planting strawberries in small beds.

Patterns may be secured by mail, at 15 cents each, postpaid, from AMERICAN FRUIT GROWER MAGAZINE PATTERN SERVICE, 261 Fifth Ave., New York

### Spring Styles

A SIMPLE Classic Tailleur (No. 494). The most interesting thing about this practical dress is the wrapped treatment. The bodice is crossed and buttoned at the left side front in line with the edge of the circular front section, which gives the figure lengthened line. Designed for sizes 16, 18, 20 years, 36, 38, 40 and 42 inches bust measure. Size 36 requires 3½ yards of 40-inch material with ½ yard of 40-inch contrasting.

MORNING Frock (No. 3495). The surprise closing of the model illustrated is especially slenderizing. It molds its hipline through a wide belt. The belt is passed through a bound opening, leaving the front of the dress in panel effect. It buttons in youthful manner at the back. Designed for sizes 16, 18 years, 36, 38, 40, 42 and 44 inches bust measure. Size 36 requires 2¾ yards of 39-inch material with 11 yards of binding.



**SCARFF'S**  
Berry Plants  
Grown in the Heart of Ohio  
1400 acres of most fertile soil. Small fruit plants and ornamentals our specialty. Healthy, vigorous stock.  
Viking Red Raspberry  
Latham Red Raspberry  
Van Fleet Red Raspberry  
Youngberry (Young Dewberry)

New Logan Black Cap—more resistant to Mosaic  
Gallia Beauty Apple—Red Strain of Rome

These outstanding new varieties and the best of the standard kinds are fully described in our new catalog. Send for your FREE copy today.

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Box F37 New Carlisle, Ohio

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25c plus your money back, if Tempto Rat Killer fails to get them all. ONLY KIND, not a squill or other poison. Harmless to anything but Rats and Mice. Pests die outside.

Send no money—just your name to Imperial Lab., 1272 Coca Cola Bldg., Kansas City, Mo., for a large \$2.00 Farm Size pkg. (makes 200 baits), for only one dollar on 15-Days Trial. If there is a live one left, the dollar you paid the postman (with postage) will be cheerfully refunded, plus 25c for your trouble. You risk nothing, so write today.

### KINKADE GARDEN TRACTOR

A Practical, Proven Power Cultivator for Gardeners, Suburbanites, Truckers, Florists, Nurserymen, Fruit Growers, Country Estates and Poultrymen.  
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